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Spectrum Engineering (Firm)
Belt Fire Hall Maintenance Project, MT DSL-AMRB 93-M07, Cascade County,

FINAL REPORT

ELT FIRE HALL MAINTENANCE PROJECT

MT DSL-AMRB 93-M07

Cascade County, Montana

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FINAL REPORT

BELT FIRE HALL MAINTENANCE PROJECT

MT DSL-AMRB 93-M07

Cascade County, Montana

Site Located in Central Montana

T19N, R6E, NE¼NE¼ of Section 26

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December 6th, 1994

Spectrum Engineering
Billings, Montana

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1. INTRODUCTION

1.1 Project Description

The project is in an area where the AMRB had previously sealed a coal mine adit and removed a large coal slack pile from the steep slope below the adit. Soon after the AMRB completed this project, the Belt Rural Fire District constructed it's fire hall on a level area at the base of this slope. Since the initial reclamation, several large rocks had broken loose from the thick sandstone layers above the 9-foot thick coal seam and had fallen onto the jeep trail that climbs up the slope behind the fire hall to the portal area.

This maintenance project was designed to protect the fire hall from damage by falling rock and to make a second attempt at revegetating the coal slack area behind the fire hall. The operations included removing fallen rock from the jeep trail which runs along the slope behind the fire hall, regrading the trail, and erecting a rockfall protection barrier along the jeep trail. In addition, the areas near the fire hall that had been covered with acidic coal waste were treated with lime, covered with soil provided by the Contractor, fertilized, seeded and covered with erosion control blanket.

1.1.1 Location and Access

The Belt Fire Hall Maintenance Project is located in the NE¼NE¼ of Section 26, T19N, R6E in Cascade County. General access is by proceeding east from Great Falls on Highway 87/89 to the junction with Secondary 331. Belt is located about 1-mile east of the junction on Secondary 331. In Belt you turn east off Castner (Secondary 331) and cross Belt Creek on Bridge Street. The fire hall is a short distance south and east of the intersection of Bridge Street and Lewis Street. The fire hall is found on the 7½ minute USGS quadrangle named Belt, Mont. at latitude 47°23'11" and longitude 110°55'14".

1.1.2 Land Ownership

The site is owned by the following landowners:

Belt Rural Fire District
c/o James Milos
105 E. Highwood Road
Belt, MT 59412
406-277-3549

James Milos
105 E. Highwood Road
Belt, MT 59412
406-277-3549

1.1.3 History

The coal seam in this area was apparently mined prior to 1940 by the Fred Schmauch Mine. However, the site was identified as the Lewis Coulee Site. In 1985, a mine portal leading into the underground workings was sealed and a large coal slack pile was removed from the area where the fire hall now sits. Immediately after the reclamation, the landowner, deeded a portion of the site to the Belt Rural Fire District and a fire hall was constructed at the base of the slope where the slack pile had been located. Mine subsidence probably contributed to cracking and displacement in the rock layers above the coal seam causing several large blocks of sandstone to break away and fall onto the mine access trail above the fire hall. In addition, the coal slack removal area behind the fire hall had failed to revegetate.

1.2 Project Objectives

The project objective was to protect the fire hall from damage from falling rock and to take additional steps to establish vegetation on the disturbed area where the revegetation effort in 1985 had failed.

2. RESPONSIBLE PARTIES

2.1 Contractor

The successful low bidder was Marquis Excavating. Their address is shown below:

Marquis Excavating
P.O. Box 187
Ulm, MT 59845
Phone: 406/866-3530
MT Contractor's License:

2.2 Reclamation and Engineering Plan

Spectrum Engineering was assigned the responsibility of preparing the reclamation and engineering specifications prior to contractor selection. Topographic surveying and site specific reclamation planning were performed by Spectrum Engineering culminating in preparation of the project bid package.

Spectrum's address is shown below:

Spectrum Engineering
1413 4th Avenue North
Billings, Montana 59101
Phone: 406/259-2412

2.3 Quality Control Inspection

Spectrum Engineering performed the quality control inspection. Bill Maehl and Dave Murja performed project engineering functions and Hank Lowe acted as the construction inspector.

2.4 AMRB Coordination

The AMRB Project Manager was Dan Koszuta, Montana Department of State Lands, Abandoned Mine Reclamation Bureau.

3. CHRONOLOGICAL LISTING OF EVENTS

3.1 Pre-Bid Conference

A pre-bid conference was held at the site on October 5th, 1994. Dan Koszuta represented the AMRB and Dave Murja represented Spectrum Engineering. The meeting was attended by several prospective contractors.

3.2 Bid Date

The bid opening date was October 12th, 1994 at 2:00 p.m. at the Montana Department of State Lands, Abandoned Mine Reclamation Bureau's office, 1625 Eleventh Avenue, Helena, Montana.

3.3 Lowest Bids

Four (4) qualified bidders responded with bids ranging from $72,089 to $29,311. The Engineers estimate was $34,768. The bid tabulations is presented in ATTACHMENT 1. The bids are summarized below:

Marquis Excavating	$29,311.19
De Buff Drilling	$43,616.00
Century Companies J. V.	$53,300.50
Shumaker Trucking & Excavating	$72,089.00

3.4 Contract Award

The contract was awarded to Marquis Excavating who was low bidder. The prime contractor's address is shown under 2.1 Contractor above.

3.5 Contract Agreement

The Contract Agreement was signed October 27th, 1994. The Notice to Proceed was issued on October 28th, 1994 for a starting date of October 28th, 1994. The contractor was to complete the specified work within thirty (45) consecutive calendar days for an anticipated completion date of December 11th, 1994. The scheduled work was completed on November 29th, 1994.

3.6 Construction Start-up

A Pre-construction Conference was held at the site on October 31st, 1994. Marquis Excavating started moving equipment to the job site on November 1st, 1994 and started work on November 2nd, 1994.

3.7 Change Orders

One Change Order was written for this project. A copy of the Change Order is included in ATTACHMENT 2 of this report. The order was issued at the end of the project to adjust the estimated quantities to actual measured quantities for the following bid items: (1) providing and placing imported cover soil; (2) regrade jeep trail; (3) erosion control mat; (4) fertilize and broadcast seed; and, (5) remove unstable rock. Bid unit prices were used for the adjustments in all cases. The quantity used for the bid item, remove unstable rock, was actually reduced to zero (0) because this item was dropped from the work plan. The change order approved an additional $263.65

3.8 Work Stoppages

Marquis Excavating started the job on November 1st, 1994 and completed all work on November 29th, 1994. The contractor spent 18 working days on the site. The contractor was able to scheduled work on a five day per week basis using one shift. In addition, work was stopped for one day of bad weather and for a two (2) day Thanksgiving holiday.

3.9 Requests for Payment

Only a final pay payment request was made during this project. Pay Request 1-Final was for the period starting October 28th through December 1st, 1994. A copy of the Pay Request 1 in the sum of $29,574.84 less tax is included in ATTACHMENT 3.

3.10 Substantial Completion

The date of Substantial Completion was November 30th,1994.

3.11 Final Completion and Approval

A field inspection by the AMRB took place on December 1st, 1994. The Final Completion date is one year from the Substantial Completion date or December 1st, 1995.

3.12 Final Payment

Final payment was made to the Contractor on December 14, 1994. A copy of the payment request has been included in ATTACHMENT 3.

4. CONSTRUCTION

4.1 Description of Project Plan

The purpose of this project was to protect the fire hall from damage by falling rock and to revegetate the coal slack area behind the fire hall. These operations would include removing potentially unstable materials from the road and from the steep slope behind the fire hall, regrading the jeep trail, and erecting a rockfall protection barrier along the jeep trail. In addition, the areas near the fire hall that had been covered with acidic coal waste were to be treated with lime, covered with soil provided by the Contractor, fertilized, seeded and covered with erosion control blanket.

A 160 foot section of fence which crossed the project area was to be removed starting near the gate on the jeep trail. All parts from the existing fence would be considered debris and would be hauled to an approved landfill. The removed section of fence would be replaced by a rockfall barrier. The remaining portion of the fence was to be joined with the barrier to form a continuous fence line.

Approximately 160-feet of the mine access road which cuts across the slope above the fire hall would be regraded with a road profile that slopes into the hillside at 12H:1V. The finished road would be widened to a width of 12-feet. In order to widen the trail, it would be necessary to lower the existing grade. Due to the steep slope conditions in the area and the proximity of the fire hall at the base of the slope, the road would need to be excavated to grade. It was anticipated that all material cut from the slope during this operation would be moved to the disposal pits. It was estimated that 85 cubic-yards of excavation would be required to establish the required road width.

We planned to utilize two pits to dispose of coal waste which would be generated as the jeep trail was regraded for the rockfall barrier installation. Pit A would be configured as a wedge-shaped cut on the slope below the southeast end of the jeep trail. It was estimate that this pit would require 100 cubic-yards of excavation. Approximately 85 cubic-yards of this material would be stockpiled near the pit for later use in the disposal pit cap. The remaining 15 cubic-yards would be hauled around to the west side of the fire hall where it would be used as grading fill along the toe of the embankment. Disposal Pit B would be located at the northwest end of the jeep trail. This disposal area would be approximately 20' x 20' and would require 15 cubic-yards of excavation.

Before the trail could be regraded, two large sandstone blocks which had fallen onto the jeep trail would need to be removed from the trail and hauled to Pit A. The Contractor would be responsible for insuring that all structures and facilities at the base of the slope would be protected from damage resulting from his operations. The approximate size on each rock was as follows:

Rock A	4½' x 3½' x 3½'	2.0 cubic-yards
Rock B	1½' x 5' x 5'	1.4 cubic-yards

The coal slack area on the slope between the fire hall and the jeep trail and both disposal pits would be neutralized by incorporating lime into the top 6-inches. Application would be at the rate of 30 tons per acre requiring 8.4 tons of 100% pure Calcium Carbonate. Due to the steep slope conditions and the size of the application area, it was anticipated that bagged lime would be spread and incorporated by hand. The bushes growing on the coal slack area would be left in-place; so, the Contractor would be required to work around the bushes. The lime would be applied directly to the existing surface and mixed with the soil to a depth of 6-inches. The coal slack covered an area of 0.25-acres extending from an existing fence on the east side of the fire hall to about the west edge of the fire hall. It was anticipated that 0.03-acres of coal waste would also be neutralized in the disposal pits.

After the jeep trail regrading waste has been placed, compacted, graded, and neutralized in the disposal pits, the material stockpiled during the disposal pit excavation would be spread to provide a 1-foot thick layer over the top of the waste material. Any remaining material in the stockpile would be added to the cap and blended into the contours around the cap. The caps on Disposal Areas A and B would be graded to provide positive drainage.

Six-inches of contractor provided cover soil would be spread evenly over the neutralized coal slack area, the disposal area, and the grading fill areas. The amount of cover soil was estimated at 270 cubic-yards. This work was to include procuring an acceptable cover soil, hauling the cover soil to the site, spreading the cover soil, and preparing a seedbed. If the soil was delivered to the site and stockpiled, appropriate measures to contain stockpile erosion would be used. The coal slack area which was to be covered with topsoil is situated on a steep slope (around 1.5H:1V to 2.5H:1V) below the jeep trail. The fire hall sits at the base of the hill approximately 10-feet from the toe of the slope. It was anticipated that the cover soil would be dumped at the jeep trail and then pushed and racked down the slope. Due to the proximity of the structures, hand-work was anticipated. The cover soil was to be spread evenly and brought to a friable condition.

Structures were to be protected from damage by falling rock during construction and in the future. A 150 foot long rockfall protection barrier would be installed on the regraded jeep trail. This barrier would be 8-feet high and would be constructed of 12 ga. highway guardrail attached to metal posts. The metal posts would be WF 8" x 18# I-beams and would be 16-feet in length. All posts would be installed with the bottom 8-feet below grade and would be on 6'3" centers. The top 8-feet would be painted as required in the special technical specifications. Barrier rails between posts would consist of five (5) guardrail sections attached to each post with ⅝-inch in diameter oval shoulder button head bolts and nuts. All rails would be galvanized metal guardrail conforming to the requirements of ASSHO M180, Class A, Type 1. Post holes for I-beam posts would be 12-inches in diameter. All posts would be set in 3000 psi concrete. The Contractor was to make all arrangements for procuring and fabricating components and for delivering all materials to the site.

The neutralized area and adjacent fill areas (approx. 0.34 acres) would be broadcast seeded and fertilized. Areas that are seeded by the broadcast method would be seeded using an application rate of 48 pounds of pure live seed per acre which is twice the application rate for drill seeding.

Erosion control mat (North American Green SC-150 or equivalent) would be installed on all reseeded areas. The mat was to be installed according to manufacturer's recommendations by unrolling the mat down the hillside. It was specified that all installed mat should be laid loosely and stapled to the ground. The Contractor would be required to lay the mat around existing bushes. Staples were to be 8 gauge steel wire staples at least eight inches long (8" x 2" x 8"). The Contractor was to make all arrangements for obtaining the necessary materials and for delivering them to the site. It was estimated that 0.34-acres or 1,646 square-yard would be covered with erosion control mat.

After the rock fall barrier had been installed, four large sandstone blocks which could pose a potential hazard to the fire hall would be removed. These sandstone rocks were located 20-feet above the elevation of the jeep trail and were 15' to 20' from the edge of the trail. The largest of these rocks could weigh up to 13-tons. It was specified that the Contractor could select the method of removal. The approximate size on each rock was as follows:

Rock #1	5' x 3' x 11'	6.1 cubic-yards
Rock #2	5' x 4' x 2'	1.5 cubic-yards
Rock #3	7' x 3' x 1½'	1.2 cubic-yards
Rock #4	3' x 2' x 1½'	0.3 cubic-yards

The Contractor would be responsible for insuring that all structures and facilities at the base of the slope would be protected from damage resulting from his operations.

4.2 Major Equipment List

Type	Year	Make/Model	Size/Horsepower	No. on Job
Backhoe/Loader	1986	Deere 410B	62 hp	1
Motor Grader	1974	Cat 120	125 hp	1
Wheel Loader	1979	Cat 950	2½ yd/130 hp	1
Bulldozer	1973	Deere 450B	65 hp	1
Dump Truck		Ford 7000	6 yd	2
Rotary Drill				1

4.3 Contractor Employees

The contractor had from one (2) to six (6) employees working on the job site on various days. In all six (6) different employees performed different tasks at the site.

4.4 Construction Activities

After moving equipment onto the site on November 1,1994, Marquis Excavating started construction on November 2, 1994. On 11-2-94, a 160 foot section of fence which crossed the project area was removed starting near the gate on the jeep trail. In addition, two disposal pits for coal waste were dug and two large sandstone blocks which had fallen onto the jeep trail were removed on the first day of construction. A portion of the material excavated from the disposal pits was used for grading fill along the slope. The rest of the material was saved to cover the disposal areas. The contractor also began regrading approximately 160-feet of the mine access road which cuts across the slope above the fire hall.

Regrading and widening the jeep trail to a width of 12-feet took about two days of work using a backhoe/loader, wheel loader and bulldozer. Most of the work was completed by the end of November 3rd; but, final grading was not completed until November 11th. Material excavated from the road cut was moved to disposal pits located at the east and west ends of the road. After the jeep trail regrading waste was placed and neutralized in the disposal pits, the disposal pits were capped with at least 1-foot of stockpiled material.

On November 3, 1994, the contractor began delivering cover soil from his off-site source located on the Milos Ranch. The soil was stockpiled at the southeast corner of the site. Marquis Excavating utilized two (2) 6-cubic-yard dump trucks to deliver 252 cubic yards on November 3-4th. After starting to spread the soil, it was necessary to bring in an additional 90 cubic-yards to complete the job.

Between November 7th and November 9th, the contractor spread 9.6 Tons of 100% pure Calcium Carbonate on the coal slack area between the fire hall and the jeep trail and the disposal pits. Due to the steep slope conditions and the size of the application area, bagged lime was spread and incorporated by hand. The bushes growing on the coal slack area were left in-place. The lime was applied directly to the existing surface and mixed with the soil to a depth of 6-inches.

Marquis Excavating spread 342 cubic-yards of cover soil over the neutralized coal slack area, the disposal area, and the grading fill areas. This task was started on November 9th, 1994 and was completed on November 11th, 1994. The contractor used his 2½ cubic-yard wheel loader to load-haul-dump the cover soil which he had stockpiled below the road. The soil was dumped along the jeep trail and then pushed and racked down the slope. A John Deere bulldozer assisted in this operation. An average thickness of 7-inches of cover soil was placed on the slope.

On November 14th, 1994, the contractor began laying-out the 150 foot long rockfall protection barrier that was to be installed on the regraded jeep trail. Roscoe Steel delivered the components for the 8-feet high barrier on November 4th. Components for the barrier included the following:

1) 25 posts - each WF 8" x 18# I-beams that were 16-feet in length.
2) 30 guardrail sections- each 12 GA. galvanized guardrail that were 25-foot in length.
3) 5/8-inch galvanized bolts and nuts.

All post holes for the I-beam posts were drill on November 15th using a rotary drill with a 12-inches diameter bit. All holes were drilled to a depth on 8-feet. On November 16th, all posts were set in-place with 3000 psi concrete leaving the top 8-feet of each I-beam above ground. Between November 16th and November 22nd, Marquis Excavating had a crew of 4-5 men

working on the installation of guardrail. Five (5) rails were installed on each post. On November 28th, the rockfall barrier was completed by joining the remaining portions of the original fence to the barrier to form a continuous fence line.

The portion of the disturbed area which had been covered with imported soil was broadcast seeded and fertilized on November 15, 1994. The cover soil stockpile area was revegetated on November 29th, 1994. An application rate of approximately 30 pounds of pure live seed per acre was used.

North American Green SC-150 erosion control mat was installed on all reseeded areas except for the stockpile area where straw mulch was used. The Contractor laid the mat around existing bushes and used 8 gauge steel wire staples (8" x 2" x 8") to anchor the mat. The Contractor installed a total of 1,800 square-yard of erosion control mat. He covered the disposal areas on November 15th, 1994; and, installed erosion control mat on the remaining areas on November 23, 1994 and on November 29,1994.

After the rock fall barrier had been installed, Dan Koszuta and Henry Lowe inspected the four large sandstone blocks which were thought to pose a potential hazard to the fire hall and concluded that the barrier provided adequate protection. Consequently, removal of rock from the cliff above the jeep trail was omitted from the project requirements.

4.5 Quantities Used

All work items except mobilization were bid on a unit price basis. An on-site construction inspector measured items for payment and recorded load counts. Bid quantities were adjusted based on field measurements. No disputes were raised by the Contractor.

Item	Amount	Unit Cost
REMOVE FENCE	160 ft	1.00\ft
DISPOSAL PIT EXCAVATION	115 cy	15.00\cy
DISPOSAL PIT CAP	100 cy	10.00\cy
PROVIDE AND PLACE IMPORTED COVER SOIL	342 cy	15.00\cy
PROVIDE AND INSTALL ROCKFALL BARRIER	150 ft	82.47\ft
REGRADE JEEP TRAIL	125 cy	10.00\ft
NEUTRALIZE COAL SLACK	0.28	8857.14\ac
EROSION CONTROL MAT	1,800 sq yd	1.44\sq yd
FERTILIZE AND BROADCAST SEED	0.40 ac	698.53\ac
REMOVE ROCK ON TRAIL	3.4 cy	70.59\cy
REMOVE UNSTABLE ROCK	0.0 cy	162.64\cy

5. PAYMENT REQUESTS

5.1 Pay Request

One pay request was processed for this project as addressed under Section 3.10 above. A copy of this pay request has been included in ATTACHMENT 1.

5.2 Cost per Site

Site Name	Disturbed Acres	Construction Cost/Acre	Total Project Cost
BELT FIRE HALL	0.40	$73,937.10	$ 55,329.16

5.3 Total Project Cost

The construction cost for the project was $29,574.84. Marquis Excavating was awarded the contract for an original bid of $29,311.19. One change order issued for $263.65.

The total engineering cost for the project was $25,754.32. It cost $12,027.30 to complete a topographic survey of the site, attend several meetings, design the reclamation plan to reduce the slope behind the fire hall, and prepare a draft bid package for that plan. After the first plan was rejected, it cost and additional $5,879.47 to prepare a scaled-down mitigation plan, prepare a revised draft bid package for AMRB review, prepare 30 bid packages, attend a Prebid Conference and respond to bidder questions. The remaining $7,847.55 was spent on construction inspection ($4,114.31), management ($1,342.33), and final report preparation ($2,390.91). An analysis of the engineering costs versus construction costs is presented in ATTACHMENT 4.

6. PROJECT SUMMARY

6.1 Summary of Project

In 1993, the Rural Fire District informed the AMRB that fallen rock was threatening to slip down the slope behind the fire hall and damage their structure. The AMRB immediately had a contractor move one large block of sandstone that was perched on the edge of the trail above the fire hall.

AMRB and Spectrum personnel jointly visited the site; and, on November 9th, 1993, Spectrum was authorized to proceed with a mitigation plan to reduce the steep hillside behind the fire hall. On January 27, 1994, Spectrum Engineering submitted a draft bid package for the proposed mitigation plan. The estimated construction cost for the plan was $238,000. After landowner review, this hillside reduction plan was rejected due to the cost.

On May 3rd, 1994, AMRB, Spectrum Engineering, and Fire District personnel met at the site and agreed to consider other alternatives. Spectrum provided the AMRB with cost estimates for several options on May 9th, 1994. In August, a revised mitigation plan was prepared. On August 19th, 1994, the respective parties again met at the site to discuss final plan revisions. A final draft of the bid package was submitted to the AMRB on August 31st, 1994. Completed bid packages were delivered on September 11th, 1994.

Marquis Excavating was awarded the contract to construct the maintenance plan. The contractor competed the project during November 1994.

6.2 Site Condition after Completion

The slope between the mine access road and the fire hall has been covered with soil and planted with a native grass seed mixture. A rockfall barrier fence has been installed along the mine access road.

6.3 Maintenance or Follow-up

The site should be checked next spring for revegetation success.

6.4 Construction Bid Package

Copies of the site plan drawings which were provided in the bid package are located in ATTACHMENT 5 at the back of the final report. These site plan drawings represent the reclamation engineering design (the plan from which the contractors bid the work).

6.5 As-Built Drawings

As-built drawings are located in ATTACHMENT 6.

7. COMMENTS/SUGGESTIONS

It is apparent that a greater degree of coordination with the Belt Rural Fire District was required on this project. The engineering costs associated which the project in large measure reflect the effort that was required to develop a bid package for a relatively complex slope reduction plan that was ultimately rejected by the landowner due to his concern for cost. In retrospect, we would have been further ahead to have presented a preliminary engineering study with estimated costs to this landowner. After the landowner saw comparative costs and considered the alternatives, we were able to move quickly toward implementation of a mitigation plan. The measures we jointly selected are not permanent nor are they fail-safe. They do, however, provide a reasonable degree of protection.

During construction, we experienced some difficulty aligning the barrier posts because the drill

hole size which we specified provided too little tolerance and because the contractor lacked experience in this type of construction. If we had done some test drilling on the road, we would have been able to determine whether auger drilling with a larger diameter bit would have been feasible. It is probable that most of the bids provided for high drilling costs in the anticipation of hitting hard sandstone layers. Consequently, providing the results of a drilling program would probably have made the bids closer.

Because Spectrum Engineering was providing construction management services for two AMRB projects in the same general area, our construction inspector split his time between the two construction sites. This unusual circumstance provided a reasonable degree of inspection at a much reduced cost.

8. PHOTOGRAPHS/SLIDES

8.1 Listing

A description of the photographs taken to document the work performed is found at the back of the final report under ATTACHMENT 7. Picture numbers 13 and 20 show the equipment used to execute the work. Numbers 1 through 12 are views of the site prior to construction. Numbers 59 and 60 are views of the site after construction. The numbers on each picture correspond to the listing which precedes the photographs.

ATTACHMENT 1

BID TABULATION

BELT FIRE HALL MAINTENANCE PROJECT
CASCADE COUNTY, MONTANA

BID TABULATIONS				ENGINEER'S ESTIMATE		MARQUIS EXCAVATING		DE BUFF DRILLING		CENTURY COMPANIES J.V.	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price						
1.	1	LS	Mobilization	200.00	3,000.00	2347.92	2,347.92	5000.00	5,000.00	5,500.00	5,500.00
2.	160	Foot	Remove Fence	3.00	160.00	1.00	160.00	2.00	170.00	25.00	800.00
3.	115	CY	Disposal Pit Excavation	3.00	345.00	1[illegible].00	1,725.00	4.00	460.00	10.00	1,150.00
4.	100	CY	Disposal Pit Exp	3.00	300.00	10.00	1,000.00	3.00	300.00	10.00	1,000.00
5.	270	CY	Provide and place imported cover soil	6.00	1,620.00	1[illegible].00	4,050.00	10.00	10,800.00	25.00	6,750.00
6.	150	Foot	Provide and install rockfall barrier	120.00	18,000.00	82.47	12,370.50	120.00	18,000.00	125.00	18,750.00
7.	85	CY	Regrade Jeep Trail	5.00	425.00	10.00	850.00	4.00	340.00	3[illegible]0.00	850.00
8.	0.28	Acre.	Neutralize Coal Slack	10000.00	2,800.00	8857.14	2,480.00	4000.00	1,120.00	25,000.00	7,000.00
9.	1646	Sq Ya	Erosion Control Mat	3.00	4,938.00	1.44	2,370.24	4.00	6,584.00	4.75	7,818.50
10.	0.34	Acre	Fertilize and broadcast seed	2000.00	3,[illegible]0.00	698.53	237.50	1000.00	340.00	800.00	7,[illegible]0.00
11.	3.4	CY	Remove rock on trail	200.00	680.00	70.59	240.01	50.00	170.00	80.00	272.00
12.	3.4	CY	Remove unstable rock	200.00	1,820.00	162.64	1,480.02	20.00	17[illegible].00	300.00	2,730.00
					34,768.00		29,311.19		43,616.00		53,300.50

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DSL/AMRB 93-M07
October 12, 1994

BELT FIRE HALL MAINTENANCE PROJECT
CASCADE COUNTY, MONTANA

BID TABULATIONS				ENGINEER'S ESTIMATE		SHUMAKER TRUCKING & EXCAVATING					
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price						
1.	1	LS	Mobilization	200.00	3,000.00	23,000.00	23,000.00	0.00	0.00	.0	0.00
2.	160	Foot	Remove Fence	1.00	345.00	4.00	160.00	0.00	0.00		0.00
3.	115	CY	Disposal Pit Excavation	3.00	345.00	15.00	1,150.00	0.00	0.00		0.00
4.	100	CY	Disposal Pit Cap	3.00	300.00	[illegible].00	500.00	0.00	0.00	.00	0.00
5.	270	CY	Provide and place imported cover soil	6.00	1,620.00	15.00	4,050.00	0.00	0.00	.00	0.00
6.	160	Foot	Provide and install rockfall barrier	120.00	18,000.00	15[illegible].00	27,750.00	0.00	0.00		0.00
7.	85	CY	Regrade Jeep Trail	5.00	425.00	15.00	160.00	0.00	0.00		0.00
8.	0.28	Acre.	Neutralize Coal Slack	10000.00	2,800.00	19000.00	5,320.00	0.00	0.00		0.00
9.	1646	Sq Ya	Erosion Control Mat	3.00	4,938.00	4.00	6,584.00	0.00	0.00		0.00
10.	0.34	Acre	Fertilize and broadcast seed	2000.00	680.00	2500.00	850.00	0.00	0.00		0.00
11.	3.4	CY	Remove rock on trail	200.00	680.00	150.00	510.00	0.00	0.00		0.00
12.	3.4	CY	Remove unstable rock	200.00	1,620.00	150.00	1,365.00	0.00	0.00		0.00
					34,768.00		72,089.00		0.00		0.00

G:\RECLAM\AMRB\BID-TAB.TBL

ATTACHMENT 2

CHANGE ORDERS

RECEIVED
DEC 1 3 1994
STATE LANDS

CHANGE ORDER

ORDER NO. 1

PROJECT TITLE: Belt Fire Hall Maintenance Project

MONT A/E or DSL-AMRB: 93-M07

CONTRACT DATE: October 27th, 1994

OWNER: Department of State Lands, Abandoned Mine Reclamation Bureau

CONTRACTOR: Marquis Excavating

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
5.	Provide and place imported cover soil Quantity increased by 72 CY					15.00	1,080.00
7.	Regrade jeep trail Quantity increased by 40 CY					10.00	400.00
9.	Erosion control mat Quantity increased by 154 Sq. Yds.					1.44	221.76
10.	Fertilize and broadcast seed Quantity increased by 0.06 Acre					698.53	41.91
12.	Remove Unstable Rock Quantity reduced by 9.1 CY					162.64	(1480.02)
	TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.						263.65
	OVERHEAD & PROFIT @ _____%						INC.
	GRAND TOTAL - THIS CHANGE ORDER						$ 263.65

Original Contract Price	$ 29,311.19
Current Contract Price Adjusted by Previous Change Order	$ 29,311.19
Cost this Change Order (+ or -)	+ $ 263.65
New Contract Price including this Change Order	$ 29,574.84

The completion date as set forth in the Contract Documents shall be ([✓ unchanged], increased, decreased) by 0 calendar days.

The date for completion of all work was 12/11/1994.

Description and Justification for Change:

5. Bid item 5 - The change reflects the difference between the estimated (270 CY) and the actual measured (342 CY) quantity of cover soil which was provided and placed.

7. Bid item 7 - The change reflects the difference between the estimated (85 CY) and the actual measured (125 CY) quantity of excavation required to regrade the jeep trail.

9. Bid item 9 - The change reflects the difference between the estimated (1646 Sq. Yds.) and the actual measured (1800 Sq. Yds.) quantity of erosion control mat which was provided and placed.

10. Bid item 10 - The change reflects the difference between the estimated (0.34 Acres) and the actual measured (0.40 Acres) quantity of fertilize and broadcast seeding which was required.

12. Bid item 12 - Removal of unstable rock on the sandstone cliff above the fire hall was not considered necessary after the rockfall barrier had been constructed; therefore the quantity of this item was redued from 9.1 CY to 0 CY.

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by $ 263.65---------- (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by $ 263.65---------------(100% of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT

COGSWELL AGENCY

BY: EBCogswell

E.B. COGSWELL, RESIDENT AGENT

SURETY

TIG PREMIER INSURANCE COMPANY

By: EBCogswell

E.B. COGSWELL, Seal ATTORNEY-IN-FACT

Recommended by: Spectrum Engineering William C Maehl 12/1/94

Engineer Date

Accepted by: Marquis Excavating 12/3/94

Contractor Date

Approved by: DM Kozuta 12-13-94

Owner Date

ATTACHMENT 3

PAYMENT REQUEST

RECEIVED
DEC 13 1994
STATE LANDS

PAYMENT REQUEST NO. 1-Final

FROM 10/28/1994 TO 12/01/1994

PROJECT TITLE: BELT FIRE HALL MAINTENANCE PROJECT

LOCATION: CASCADE COUNTY MONT A/E or DSL-AMRB: 93-M07

NAME OF CONTRACTOR: MARQUIS EXCAVATING

ADDRESS: P.O. Box 187, ULM, MT 59485

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ 29,311.19
Change Order No. 1	$ 263.65	
Change Order No.	$	
Change Order No.	$	
Amount of Approved Change Order(s)		$ 263.65
TOTAL CONTRACT AMOUNT		$ 29,574.84

Pay Request No.	Amount of Request
1 - Final	29,574.84

Total Contract Amount Completed to Date	$ 29,574.84
Less Retainage (0 %)	$ 0.00
TOTAL AMOUNT EARNED TO DATE	$ 29,574.84
Less Previous Payments	$ 0.00
AMOUNT DUE THIS PAYMENT	$ 29,574.84
Less 1% Tax	$ 295.75
TOTAL DUE CONTRACTOR	$ 29,279.09

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

MARQUIS EXCAVATING
Contractor

By Harvey Marquis owner

Date 12-2-94

RECOMMENDED BY:

SPECTRUM ENGINEERING
Engineer

By William C Maehl

Date 12/1/94

APPROVED BY:

DEPARTMENT OF STATE LANDS, ABANDONED MINE RECLAMATION BUREAU
Owner

By DmKozuta

Date 12/13/94

RESP. CNTR. 30160 950066-01 F
OBJ. EXP. 2121
APPROVAL OK DMK
DATE 12-13-94

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
1.	Mobilization	1 LS	$2,347.92	0	1	1	$2,347.92	$2,347.92
2.	Remove Fence	160 Foot	$1.00	0	160	160	$160.00	$160.00
3.	Disposal Pit Exc.	115 CY	$15.00	0	115	115	$1,725.00	$1,725.00
4.	Disposal Pot Cep	100 CY	$10.00	0	100	100	$1,000.00	$1,000.00
5.	Provide and Place Imported Cover Soil	270 CY	$15.00	0	342	342	$5,130.00	$5,130.00
6.	Provide end Instell Rockfall Barrier	150 Foot	$82.47	0	150	150	$12,370.50	$12,370.50
7.	Regrede Jeep Treil	85 CY	$10.00	0	125	125	$1,250.00	$1,250.00
8.	Neutralize Coal Slack	0.28 Acres	$8,857.14	0	0.28	0.28	$2,480.00	$2,480.00
9.	Erosion Control Mat	1,646 Sq Yd	$1.44	0	1800	1800	$2,592.00	$2,592.00
10.	Fertilize end Broedcest Seed	0.34 Acres	$698.53	0	0.40	0.40	$279.41	$279.41
11.	Remove Rock on Treil	3.4 yds	$70.59	0	3.4	3.4	$240.01	$240.01
12.	Remove Unsteble Rock	9.1 CY	$162.64	0	0	0	$0.00	$0.00
	TOTALS						$29,574.84	$29,574.84

ATTACHMENT 4

ANALYSIS OF CONSULTANT COSTS INCURRED

ANALYSIS OF CONSULTANT COSTS INCURRED
FOR THE MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
AMR PROJECT NUMBER: DSL-AMRB 93-M07
BELT FIRE HALL MAINTENANCE PROJECT

DATE OF PREPARATION: NOV 8TH, 1994

ENGINEERING SERVICE	AMOUNT
DESIGN ENGINEERING:	$17,906.77
CONSTRUCTION INSPECTION:	$4,114.31
CONSTRUCTION ADMINISTRATION :	$3,733.24
PROJECT ENGINEERING COST:	$25,754.32.
CONSTRUCTION COST:	$29,574.84

PERCENTAGE ENGINEERING FEES TO CONSTRUCTION COST:

DESIGN ENGINEERING/CONSTRUCTION COST	60.55%
CONSTRUCTION ENGINEERING/CONSTRUCTION COST	26.53%
TOTAL ENGINEERING COST/CONSTRUCTION COST	87.08%

REMARKS: Services provided included surveying, engineering and reclamation design, bid document preparation, contract administration, quantity accounting, part time construction/reclamation inspection and final report preparation and project close-out.

ATTACHMENT 5

CONSTRUCTION BID PACKAGE DRAWINGS

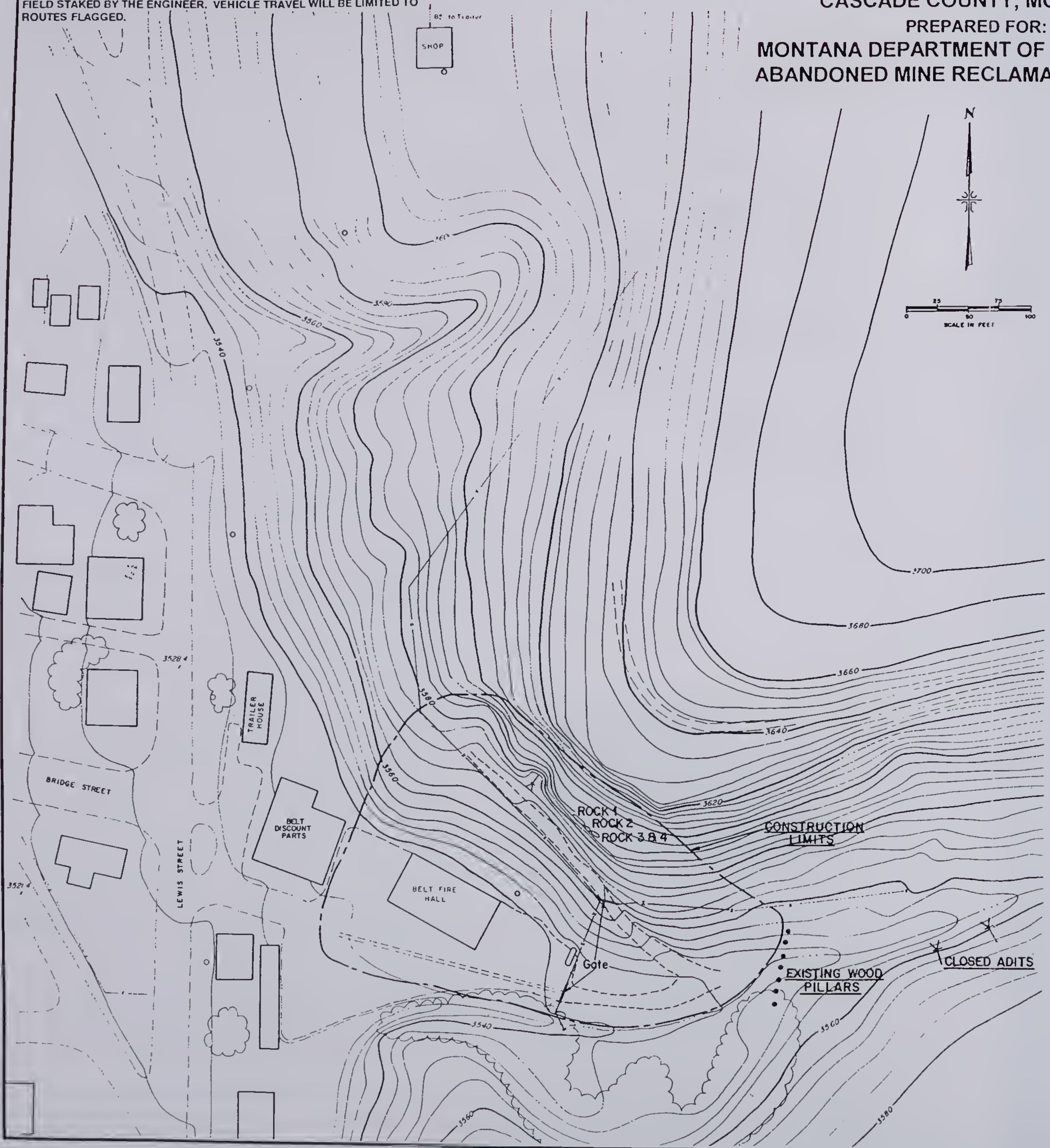
BELT FIRE HALL PROJECT

DSL-AMRB 93-M07

LOCATED IN
CASCADE COUNTY, MONTANA
PREPARED FOR:
MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU

CONSTRUCTION LIMITS

ACCESS ROUTES, WORK AREAS, AND CONSTRUCTION LIMITS WILL BE FIELD STAKED BY THE ENGINEER. VEHICLE TRAVEL WILL BE LIMITED TO ROUTES FLAGGED.



LEGEND

—3600—	CONTOUR
▭	BUILDING
—K	CLOSED ADIT
—•—•—	FENCE
— - —	CONSTRUCTION LIMITS
①	PICTURE NUMBER AND ORIENTATION

LANDOWNER(S)

NE¼NE¼ of Section 26,
In T19N, R6E

Belt Rural Fire District
c/o James Milos
105 E. Highwood Road
Belt, MT 59412
Phone: 406-277-3549

James Milos
105 E. Highwood Road
Belt, MT 59412
Phone: 406-277-3549

ARCHAEOLOGICAL NOTICE

THERE MAY BE ARCHAEOLOGICAL SITES IN THE VICINITY OF THIS SITE. ANY ARCHAEOLOGICAL MATERIALS NEAR THE CONSTRUCTION AREA WILL BE MARKED BY THE OWNER. AT NO TIME SHALL THESE ARCHAEOLOGICAL MATERIALS BE DISTURBED WITHOUT WRITTEN PERMISSION FROM THE OWNER.

HAZARD NOTICE

THE CONTRACTOR, SUBCONTRACTORS, AND THEIR EMPLOYEES WILL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS IN THE PERFORMANCE OF THE REQUIRED WORK. CONTRACTORS AND OTHER PERSONS WORKING AT THIS SITE SHALL BE FULLY RESPONSIBLE FOR APPRISING THEMSELVES OF ANY HAZARDOUS CONDITIONS WHICH MAY EXIST AND SHALL TAKE WHATEVER STEPS ARE NECESSARY TO INSURE THEIR SAFETY AND THE SAFETY OF OTHERS WHILE PERFORMING THEIR DUTIES.

TOPOGRAPHIC MAP PREPARED FROM A COMBINATION OF ASSOCIATED SURVEYS TOPOGRAPHY OF 2/7/1984 WITH GROUND CONTROL BY MT DSL, INTERPOLATION TO USGS 7½ QUAD AND TOTAL STATION CONTROL IN 1993. TOPOGRAPHY IS OF RECONNAISSANCE CLASS AND HAS NOT BEEN FIELD CHECKED. VERTICAL DATUM IS BASED ON INTERPOLATION OF BELT, MT USGS 7½' QUADRANGLE.

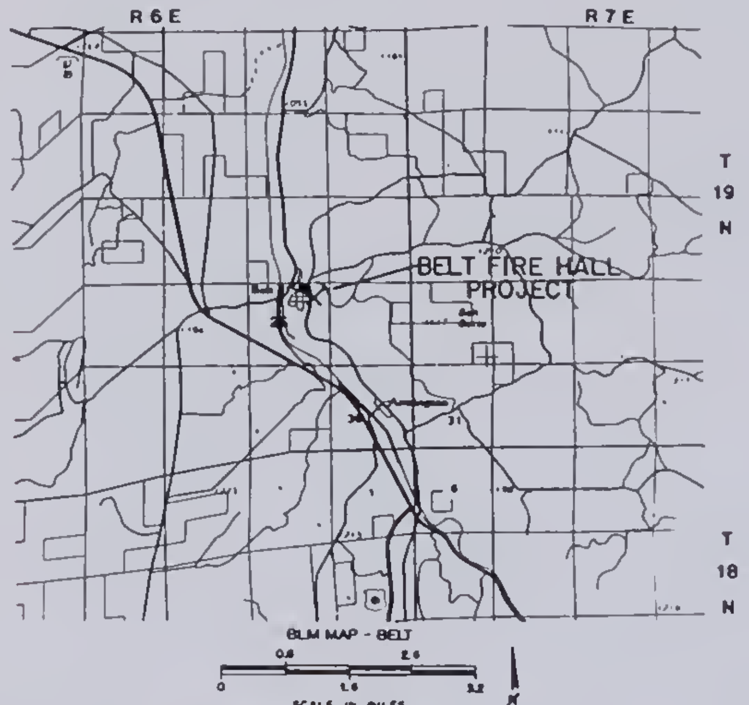
ADDITIONAL INFORMATION PERTAINING TO THIS SITE MAY EXIST IN THE DEPARTMENT OF STATE LANDS' FILES OR AT SPECTRUM ENGINEERING'S OFFICE. THIS MATERIAL IS AVAILABLE FOR REVIEW BY ANY INTERESTED PARTY.

ENGINEER'S CERTIFICATE

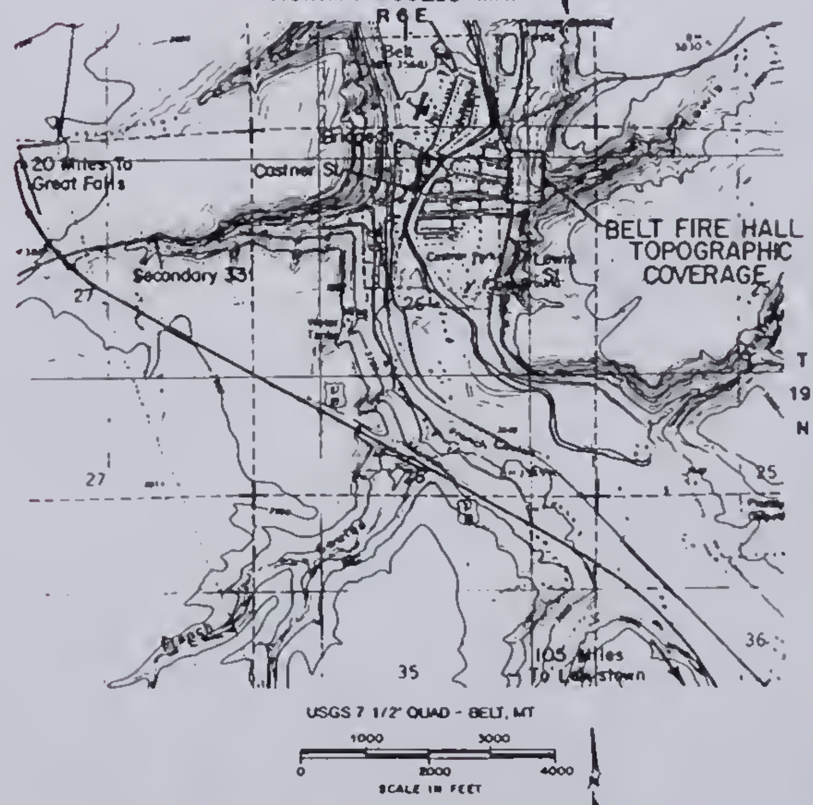
I HEREBY CERTIFY THAT THE WORK SHOWN ON THESE MAPS AND PLANS WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

William C. Maehl
Montana P.E. No. 5274 PE

STATE LOCATION MAP



VICINITY ACCESS MAP



SITE LOCATION MAP

SITE PLAN AND GENERAL LAYOUT

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

STATE OF MONTANA, DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
1625 Eleventh Avenue, Helena, Montana 59620

SPECTRUM ENGINEERING
Mining and Civil Engineers
1413 4th Avenue North
Billings, Montana 59101
Phone: 406-259-2412

DATE: September 1994
DRAWN BY: DLO
APPROVED BY: DM

REVISIONS		
NO.	DATE	BY

SHEET NO. 1 of 3

BELT FIRE HALL WORK DESCRIPTION

Remove Fence - A 160 foot section of fence will be removed starting near the gate on the jeep trail. All parts from the existing fence will be considered debris and will be hauled to an approved landfill. The removed section of fence will be replaced by the rockfall barrier. The remaining portion of the fence will be joined with the barrier to form a continuous fence line.

Disposal Pit Excavation - Disposal pits will be constructed in the areas specified on the site plan. Pit A will be configured as a wedge-shaped cut on the slope below the southeast end of the jeep trail. The base of the cut will extend 25 feet into the slope on a slight incline. The pit will be 35-feet wide at the toe and will narrow to a width of 18-feet at the end-wall. The highest wall on the cut should be around 10-feet high. It is estimated that the pit will require 100 cubic-yards of excavation. Approximately 85 cubic-yards of this material will be stockpiled near the pit for later use in the disposal pit cap. The remaining 15 cubic-yards will be hauled around to the west side of the fire hall where it will be used as grading fill along the toe of the embankment.

Disposal Pit B will be located at the northwest end of the jeep trail. This disposal area will be approximately 20' x 20'. This area must be cleared and 1-foot of material will be stripped from the surface and stockpiled nearby for later use in the disposal pit cap. It is estimated that 15 cubic-yards will be stockpiled.

Remove Rock on Trail - A number of large sandstone blocks must be removed from the trail above the fire hall because they block the trail and present a potential hazard to the structure. Two large rocks have fallen onto the jeep tall and must be removed. The larger rock could weigh up to 4.5 tons. The rocks will be hauled to Disposal Area A. The Contractor will be responsible for insuring that all structures and facilities at the base of the slope will be protected from damage resulting from his operations. The approximate size on each rock is as follows:

Rock A	4½' x 3½' x 3½'	2.0 cubic-yards
Rock B	1½' x 5' x 5'	1.4 cubic-yards

Regrade Jeep Trail - Approximately 160-feet of the mine access road which cuts across the slope above the fire hall will be regraded with a road profile that slopes into the hillside at 12N:1V as illustrated on Sheet 3 of the Site Plans. The finished road will be widened to a width of 12-feet. In order to widen the trail, it will be necessary to lower the existing grade. Due to the steep slope conditions in the area and the proximity of the fire hall at the base of the slope, the road will need to be excavated to grade. It is anticipated that all material cut from the slope during this operation will need to be moved to the disposal areas specified on the site plan. It is estimated that 85 cubic-yards of excavation will be required to establish the required road width. An average cut slope of 1N:1V will be maintained unless the Owner's engineering representative authorizes a steeper slope based on field observations. The disposal areas will be located at the northwest end on the jeep trail and below the trail at the southeast end. The Contractor will be responsible for insuring that all structures and facilities at the base of the slope will be protected from damage resulting from his operations.

Neutralize Coal Slack - The coal slack area on the slope between the fire hall and the jeep trail and both disposal pits will be neutralized by incorporating lime into the top 6-inches. Application will be at the rate of 30 tons per acre requiring 8.4 tons of 100% pure Calcium Carbonate. The Contractor will provide the Owner's representative with a certification of purity, size analysis, and weight for the lime delivered on site prior to application. Due to the steep slope conditions and the size of the application area, it is anticipated that bagged lime will be spread and incorporated by hand. There are a few bushes growing on the coal slack area. These bushes will be left in-place; so, the Contractor will be required to work around the bushes. The lime will be applied directly to the existing surface and mixed with the soil to a depth of 6-inches. The coal slack covers an area of 0.25-acres extending from an existing fence on the east side of the fire hall to about the west edge of the fire hall.

The two disposal areas will contain oxidized coal which must be neutralized. After the material excavated from the jeep trail has been graded in the disposal areas, lime will be incorporated into the top 6-inches. It is anticipated that 0.03-acres of coal waste will be neutralized in the disposal pits. The Contractor will make all arrangements for obtaining adequate quantities of lime and for delivering it to the site. A total of 0.28-acres of neutralization is required.

Disposal Pit Cap - After the jeep trail regrading waste has been placed, compacted, grade, and neutralized in the disposal pits, the material stockpiled during the disposal pit excavation will be spread to provide a 1-foot thick layer over the top of the waste material. Any remaining material in the stockpile will be added to the cap and blended into the contours around the cap. The caps on Disposal Areas A and B will be graded to provide positive drainage as shown on the site plans. Disposal Pit A will require 85-cubic yards and Disposal Pit B will require 15 cubic-yards.

Provide and Place Imported Coversoil - Six-inches of cover soil, which must be provided by the Contractor will be spread evenly over the neutralized coal slack area, the disposal area, and the grading fill areas. The coverage area is shown on the site plan. The amount of cover soil is estimated at 270 cubic-yards. This work includes procuring an acceptable coversoil, hauling the coversoil to the site, spreading the coversoil, and preparing a seedbed. This work will be performed in accordance with Technical Specification 310 Coversoil. Acceptable coversoil must meet the criteria outlined in Section 310.02, Paragraph B of the Standard Technical Specifications. The Contractor will be required to submit soil analysis and have the soil source approved by the Engineer. The Contractor will make all arrangements for obtaining the soil and will pay all costs associated with soil procurement including delivery.

The coal slack area which must be covered with topsoil is situated on a steep slope (around 1.5N:1V to 2.5N:1V) below the jeep trail. The fire hall sits at the base of the hill approximately 10-feet from the toe of the slope. It is anticipated that the coversoil will be dumped at the jeep trail and then pushed and racked down the slope. Due to the proximity of the structures, hand-work should be anticipated. The coversoil will be spread evenly and brought to a friable condition so that seeding can proceed without additional soil preparation.

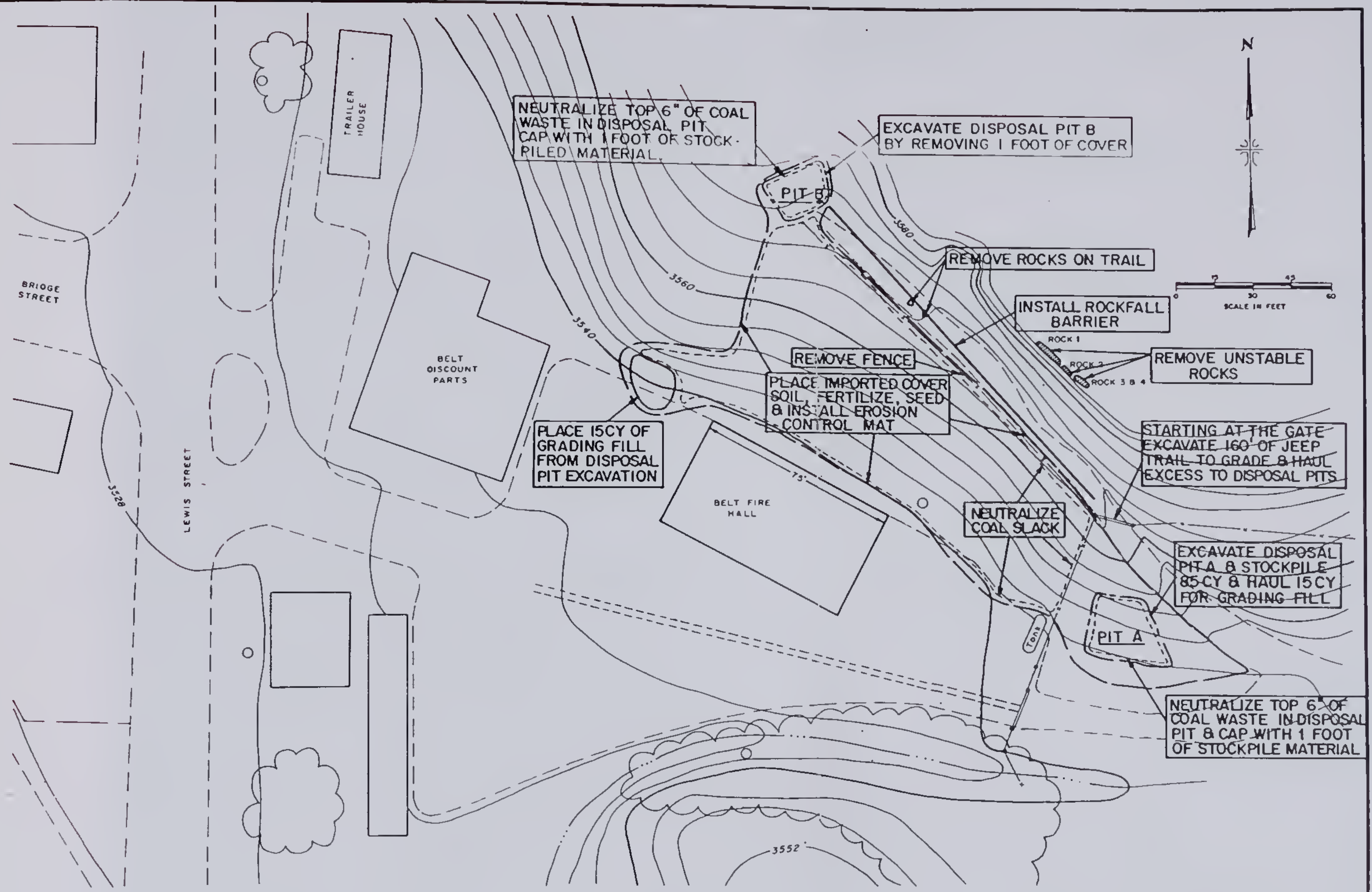
Provide and Install Rockfall Barrier - Structures must be protected from damage by falling rock during construction and in the future. A 150 foot long rockfall protection barrier will be installed on the regraded jeep trail. This barrier will be 8-feet high and will be constructed of 12 ga. highway guardrail attached to metal posts. The metal posts will be WF 8" x 18# I-beams and will be 16-feet in length. All posts will be installed with the bottom 8-feet below grade and will be on 6'3" centers. The top 8-feet will be painted as required in the special technical specifications. Barrier rails between posts will consist of five (5) guardrail sections attached to each post with ⅝-inch in diameter oval shoulder button head bolts and nuts. All rails will be galvanized metal guardrail conforming to the requirements of ASSHO M180, Class A, Type 1. Post holes for I-beam posts will be 12-inches in diameter. All posts will be set in 3000 psi concrete. The alignment of the fence is shown on the site plan A portion of an existing barbed-wire fence will be removed to allow installation of the barrier. The remaining portion of the fence will be joined with the barrier to form a continuous fence line. Rockfall barrier shall meet the requirements of the layout drawings on the site plan. Special technical specifications for the rockfall barrier are included in this bid package. The Contractor will make all arrangements for procuring and fabricating components and for delivering all materials to the site.

Fertilize and Broadcast Seed - The neutralized area and adjacent fill areas (approx. 0.34 acres) will be broadcast seeded and fertilized. Areas that are seeded by the broadcast method will be seeded using an application rate of 48 pounds of pure live seed per acre which is twice the application rate for drill seeding. The Contractor will make all arrangements for obtaining adequate quantities of the specified seed mixture and fertilizer and for delivering them to the site.

Erosion Control Mat - Erosion control mat shall be applied to all reseeded areas as shown on the Site Plans. Erosion control mat shall consist of North American Green SC-150 or equivalent. The mat shall be installed according to manufacturer's recommendations by unrolling the mat down the hillside. All installed mat should be laid loosely and stapled to the ground. The Contractor will be required to lay the mat around existing bushes. Staples shall be placed according to manufacturer's recommendations and shall be 8 gauge steel wire staples at least eight inches long (8" x 2" x 8"). The Contractor will make all arrangements for obtaining the necessary materials and for delivering them to the site. It is estimated that 0.34-acres or 1,646 square-yards will be covered with erosion control mat.

Remove Unstable Rock - After the rock fall barrier is installed, the Owner may order potentially unstable rock removed from the slope above the jeep trail. There are four large sandstone blocks which could pose a potential hazard to the fire hall. These sandstone rocks are currently either wedged or cemented in-place. They are located 20-feet above elevation of the jeep trail and are 15' to 20' from the edge of the trail. The largest of these rocks could weigh up to 13-tons. The Contractor may select the method of removal. The Contractor will be responsible for insuring that all structures and facilities at the base of the slope will be protected from damage resulting from his operations. The work includes removing the specified rocks, disposing of rock, and protecting the nearby structures. The approximate size on each rock is as follows:

Rock #1	5' x 3' x 11'	6.1 cubic-yards
Rock #2	5' x 4' x 2'	1.5 cubic-yards
Rock #3	7' x 3' x 1½'	1.2 cubic-yards
Rock #4	3' x 2' x 1½'	0.3 cubic-yards



TRAILER HOUSE
BRIDGE STREET
LEWIS STREET
3528
BELT DISCOUNT PARTS
BELT FIRE HALL
75'
NEUTRALIZE TOP 6" OF COAL WASTE IN DISPOSAL PIT CAP WITH 1 FOOT OF STOCK-PILED MATERIAL
EXCAVATE DISPOSAL PIT B BY REMOVING 1 FOOT OF COVER
PIT B
3580
3560
3540
REMOVE ROCKS ON TRAIL
INSTALL ROCKFALL BARRIER
ROCK 1
ROCK 2
ROCK 3 & 4
REMOVE UNSTABLE ROCKS
REMOVE FENCE
PLACE IMPORTED COVER SOIL, FERTILIZE, SEED & INSTALL EROSION CONTROL MAT
PLACE 15CY OF GRADING FILL FROM DISPOSAL PIT EXCAVATION
STARTING AT THE GATE EXCAVATE 160' OF JEEP TRAIL TO GRADE & HAUL EXCESS TO DISPOSAL PITS
NEUTRALIZE COAL SLACK
EXCAVATE DISPOSAL PIT A & STOCKPILE 85 CY & HAUL 15 CY FOR GRADING FILL
Tank
PIT A
NEUTRALIZE TOP 6" OF COAL WASTE IN DISPOSAL PIT & CAP WITH 1 FOOT OF STOCKPILE MATERIAL
3552
N
0
15
30
45
60
SCALE IN FEET

LIST OF ESTIMATED WORK QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	SITE NAME
1.	MOBILIZATION	LUMP SUM	1	BELT FIRE HALL
2.	REMOVE FENCE	FEET	160	JEEP TRAIL
3.	DISPOSAL PIT EXCAVATION	CUBIC YARD	115	JEEP TRAIL
4.	DISPOSAL PIT CAP	CUBIC YARD	100	JEEP TRAIL
5.	PROVIDE AND PLACE IMPORTED COVER SOIL	CUBIC YARD	270	COAL SLACK, FILL & DISPOSAL AREAS
6.	PROVIDE AND INSTALL ROCKFALL BARRIER	FEET	150	JEEP TRAIL
	Metal Guard Rail	FEET	750	
	WF 8" x 18# post	FEET	400	
7.	REGRADE JEEP TRAIL	CUBIC YARDS	85	JEEP TRAIL
8.	NEUTRALIZE COAL SLACK	ACRES	0.25	COAL SLACK
		ACRES	0.03	DISPOSAL AREAS
	100% Calcium Carbonate	TONS	8.40	@ 30 tons per ac per 6" slice
9.	EROSION CONTROL MAT (0.34 Acres)	SQ YARDS	1,646	COAL SLACK, FILL & DISPOSAL AREAS
10.	FERTILIZE AND BROADCAST SEED	ACRE	0.34	COAL SLACK, FILL & DISPOSAL AREA
	Fertilize	LBS	31.5	
	Seed	LBS-PLS	16.32	
11.	REMOVE ROCK ON TRAIL	CUBIC YARDS	3.4	JEEP TRAIL
12.	REMOVE UNSTABLE ROCK	CUBIC YARDS	9.1	SLOPE

LOOKING NORTHEAST AT THE UNSTABLE SLOPE ABOVE THE FIRE HALL.

SITE PLAN AND WORK DESCRIPTION

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

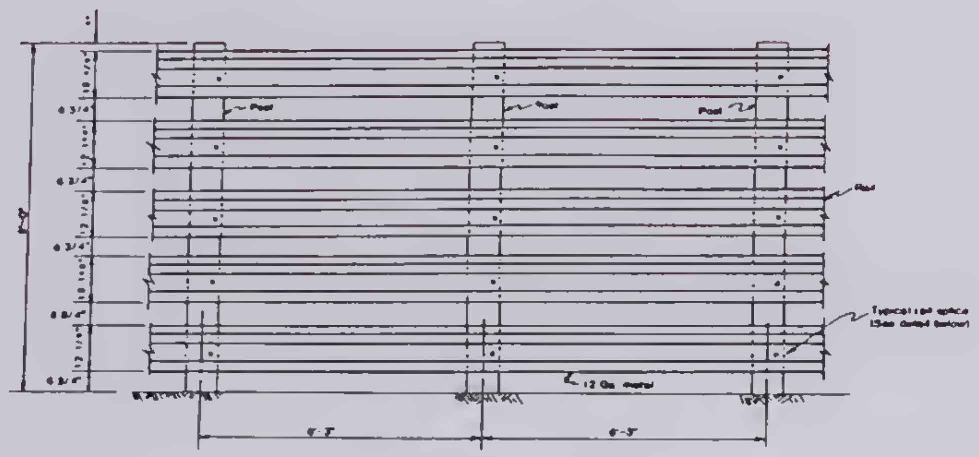
STATE OF MONTANA, DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
1625 Eleventh Avenue, Helena, Montana 59620

SPECTRUM ENGINEERING
Mining and Civil Engineers
1413 4th Avenue North
Billings, Montana 59101
Phone: 406-259-2412

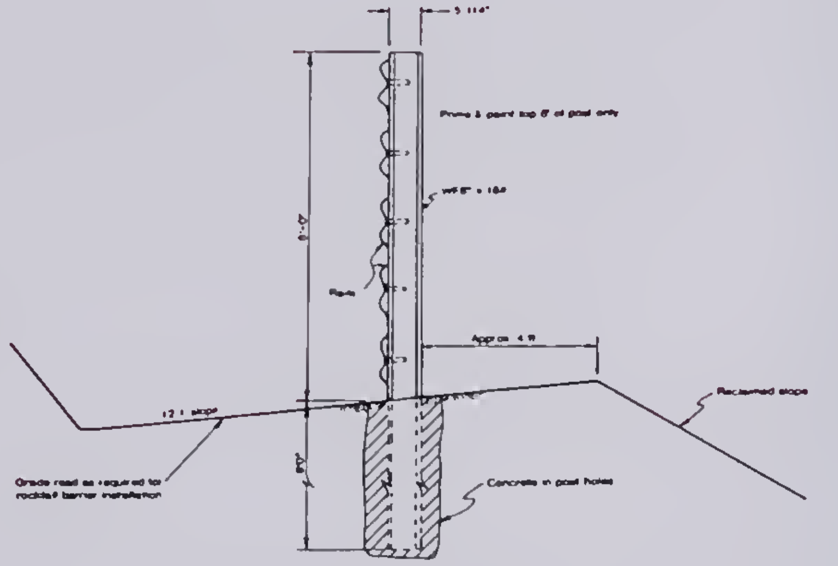
DATE: September 1994
DRAWN BY: DLO
APPROVED BY: DM

REVISIONS NO.	DATE	BY

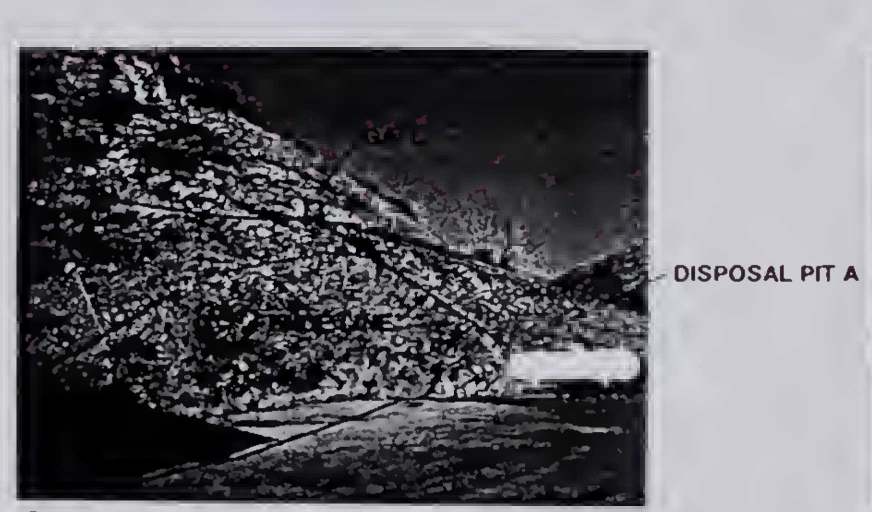
SHEET NO. 2 of 3



METAL GUARD RAIL
(Not To Scale)

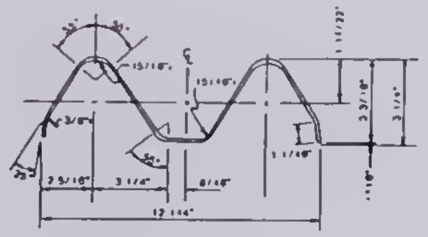

3 1/4"
Prime & paint top 6' of post only
W6" x 16#
Rails
Approx. 4 ft
12:1 slope
Reclaimed slope
Grade road as required for rockfall barrier installation
Concrete in post holes

METAL GUARD RAIL CROSS SECTION A-A'
(Not To Scale)

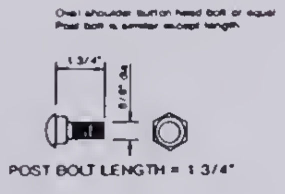


③ VIEW OF SLOPE ON EAST SIDE OF THE FIRE HALL. DISPOSAL PIT A WILL BE EXCAVATED ON THE EAST SIDE OF THE FENCE.

④ FIFTEEN CUBIC YARDS OF GRADING FILL WILL BE USED TO RECONTOUR THIS STEEP CUT SLOPE.



RAIL SECTION


Oval shoulder button head bolt or equal
Post bolt is similar except length
1 3/4"
5/8" dia.
POST BOLT LENGTH = 1 3/4"

SPLICE BOLT & NUT

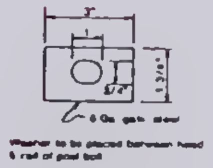
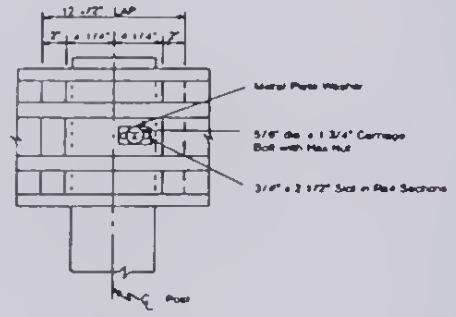


PLATE WASHER DETAIL


12 1/2" LAP
2"
4 1/4"
4 1/4"
2"
Metal Plate Washer
5/8" dia. x 1 3/4" Carriage Bolt with Hex Nut
3/4" x 2 1/2" Slot in Rail Sections
Post

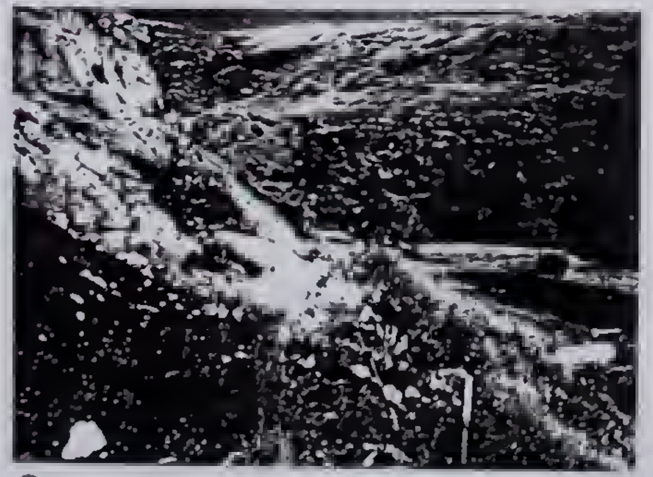
RAIL SPLICE DETAIL

NOTES

RAIL. GALVANIZED RAIL SHOULD BE GALVANIZED IN ACCORDANCE WITH ASTM A 525 OR ASTM A 123 STEEL RAIL SHALL CONFORM TO ASSHO M 180

⑤ SLOPE BELOW JEEP TRAIL WILL BE RECLAIMED WITH NEUTRALIZATION, COVER SOIL, FERTILIZER, SEED AND EROSION CONTROL MAT.

⑥ VIEW OF SLOPE BETWEEN FIRE HALL AND JEEP TRAIL.



① VIEW OF JEEP TRAIL & EXISTING FENCE.

② VIEW OF ROCKS BLOCKING JEEP TRAIL.

⑦ VIEW OF UNSTABLE ROCKS ON CLIFF.

SITE PLAN AND ROCKFALL BARRIER DETAIL

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

STATE OF MONTANA, DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
1625 Eleventh Avenue, Helena, Montana 59620

SPECTRUM ENGINEERING
Mining and Civil Engineers
1413 4th Avenue North
Billings, Montana 59101
Phone. 406-259-2412

DATE September 1994
DRAWN BY DLO
APPROVED BY DM

REVISIONS

NO	DATE	BY

SHEET NO. 3 of 3

ATTACHMENT 6

AS-BUILT DRAWINGS

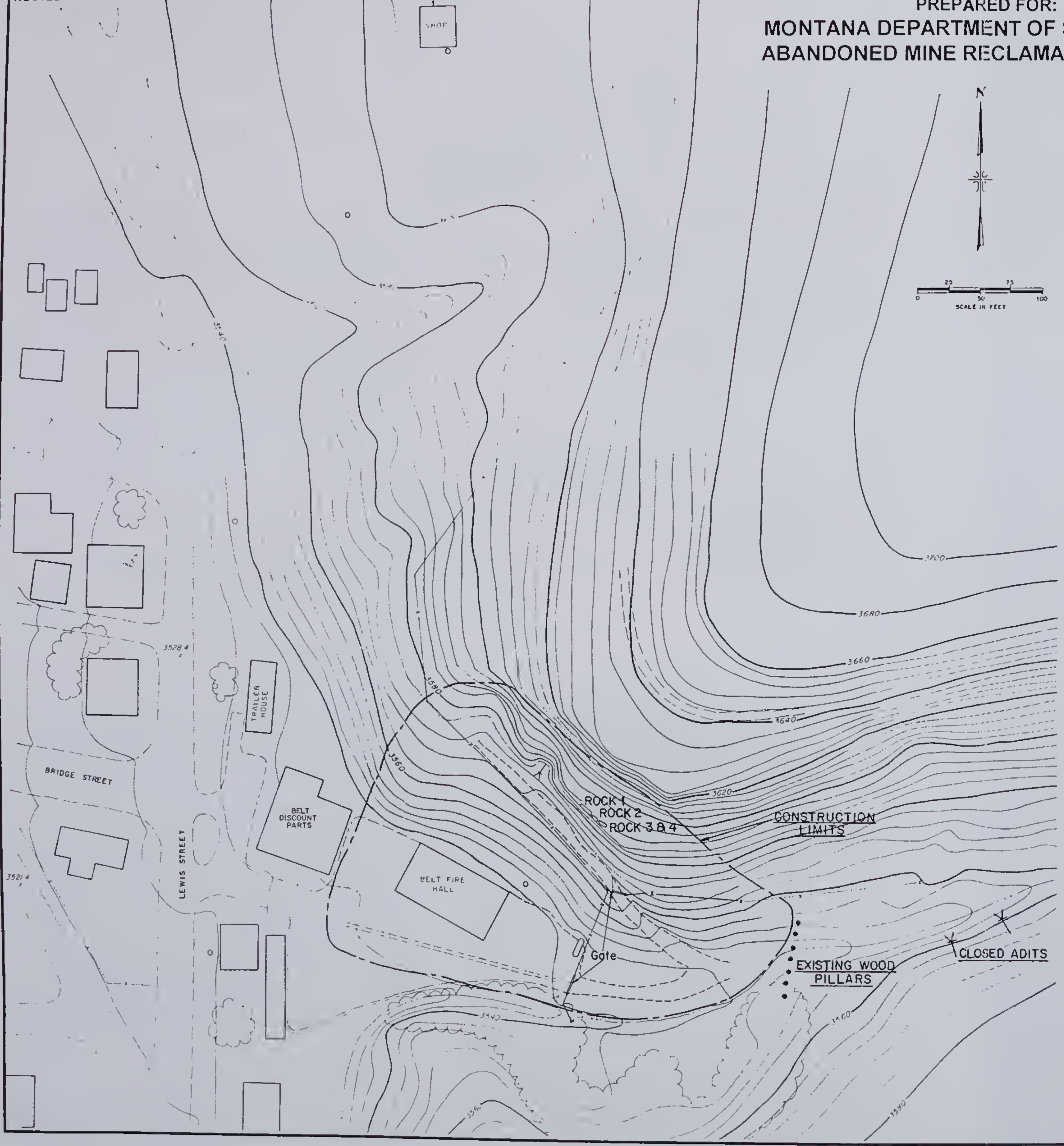
BELT FIRE HALL PROJECT

DSL-AMRB 93-M07

LOCATED IN
CASCADE COUNTY, MONTANA
PREPARED FOR:
MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU

CONSTRUCTION LIMITS

ACCESS ROUTES, WORK AREAS, AND CONSTRUCTION LIMITS WILL BE FIELD STAKED BY THE ENGINEER. VEHICLE TRAVEL WILL BE LIMITED TO ROUTES FLAGGED.



LEGEND

—3600—	CONTOUR
▭	BUILDING
—K	CLOSED ADIT
—x——x—	FENCE
—— - ——	CONSTRUCTION LIMITS
①→	PICTURE NUMBER AND ORIENTATION

LANDOWNER(S)

NE¼NE¼ of Section 26,
In T19N, R6E

Belt Rural Fire District
c/o James Milos
105 E. Highwood Road
Belt, MT 59412
Phone: 406-277-3549

James Milos
105 E. Highwood Road
Belt, MT 59412
Phone: 406-277-3549

ARCHAEOLOGICAL NOTICE

THERE MAY BE ARCHAEOLOGICAL SITES IN THE VICINITY OF THIS SITE. ANY ARCHAEOLOGICAL MATERIALS NEAR THE CONSTRUCTION AREA WILL BE MARKED BY THE OWNER. AT NO TIME SHALL THESE ARCHAEOLOGICAL MATERIALS BE DISTURBED WITHOUT WRITTEN PERMISSION FROM THE OWNER.

HAZARD NOTICE

THE CONTRACTOR, SUBCONTRACTORS, AND THEIR EMPLOYEES WILL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS IN THE PERFORMANCE OF THE REQUIRED WORK. CONTRACTORS AND OTHER PERSONS WORKING AT THIS SITE SHALL BE FULLY RESPONSIBLE FOR APPRISING THEMSELVES OF ANY HAZARDOUS CONDITIONS WHICH MAY EXIST AND SHALL TAKE WHATEVER STEPS ARE NECESSARY TO INSURE THEIR SAFETY AND THE SAFETY OF OTHERS WHILE PERFORMING THEIR DUTIES.

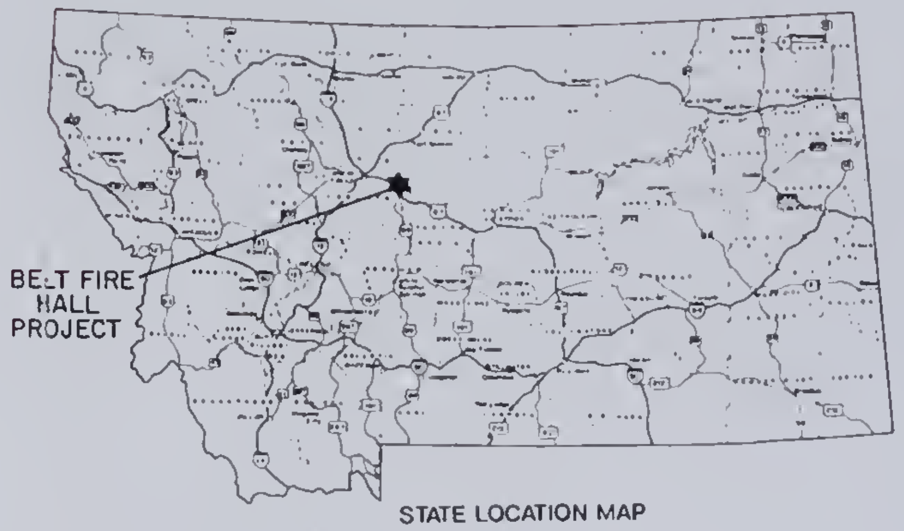
TOPOGRAPHIC MAP PREPARED FROM A COMBINATION OF ASSOCIATED SURVEYS TOPOGRAPHY OF 2/7/1984 WITH GROUND CONTROL BY MT DSL, INTERPOLATION TO USGS 7½ QUAD AND TOTAL STATION CONTROL IN 1993. TOPOGRAPHY IS OF RECONNAISSANCE CLASS AND HAS NOT BEEN FIELD CHECKED. VERTICAL DATUM IS BASED ON INTERPOLATION OF BELT, MT USGS 7½' QUADRANGLE.

ADDITIONAL INFORMATION PERTAINING TO THIS SITE MAY EXIST IN THE DEPARTMENT OF STATE LANDS' FILES OR AT SPECTRUM ENGINEERING'S OFFICE. THIS MATERIAL IS AVAILABLE FOR REVIEW BY ANY INTERESTED PARTY.

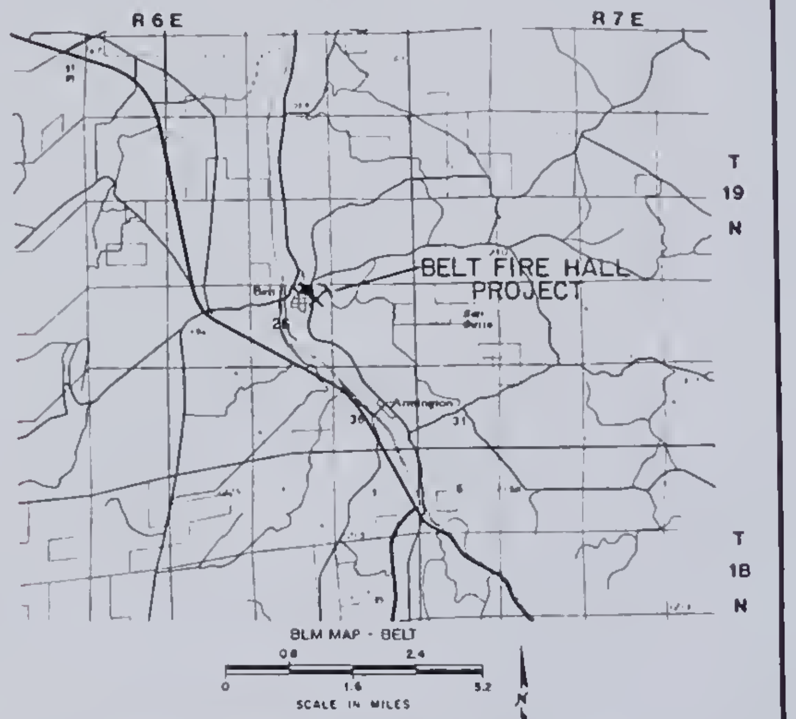
ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THE WORK SHOWN ON THESE MAPS AND PLANS WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

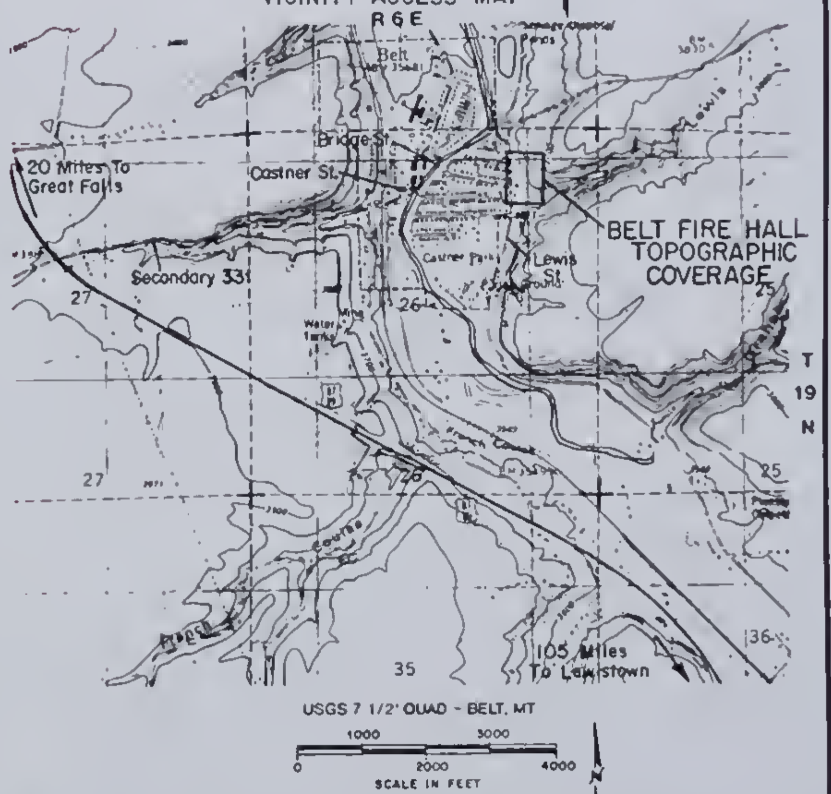
William C. Maehl
Montana P.E. No. 5274 PE



STATE LOCATION MAP



VICINITY ACCESS MAP



SITE LOCATION MAP

AS-BUILT DRAWING

SITE PLAN AND GENERAL LAYOUT

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

STATE OF MONTANA, DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
1625 Eleventh Avenue, Helena, Montana 59620

SPECTRUM ENGINEERING
Mining and Civil Engineers
1413 4th Avenue North
Billings, Montana 59101
Phone: 406-259-2412

DATE: September 1994
DRAWN BY: DLO
APPROVED BY: DM

REVISIONS NO.	DATE	BY

SHEET NO. 1 of 3

BELT FIRE HALL WORK DESCRIPTION

Remove Fence - A 160 foot section of fence will be removed starting near the gate on the jeep trail. All parts from the existing fence will be considered debris and will be hauled to an approved landfill. The removed section of fence will be replaced by the rockfall barrier. The remaining portion of the fence will be joined with the barrier to form a continuous fence line.

Disposal Pit Excavation - Disposal pits will be constructed in the areas specified on the site plan. Pit A will be configured as a wedge-shaped cut on the slope below the southeast end of the jeep trail. The base of the cut will extend 25 feet into the slope on a slight incline. The pit will be 35-feet wide at the toe and will narrow to a width of 18-feet at the end-wall. The highest wall on the cut should be around 10-feet high. It is estimated that the pit will require 100 cubic-yards of excavation. Approximately 85 cubic-yards of this material will be stockpiled near the pit for later use in the disposal pit cap. The remaining 15 cubic-yards will be hauled around to the west side of the fire hall where it will be used as grading fill along the toe of the embankment.

Disposal Pit B will be located at the northwest end of the jeep trail. This disposal area will be approximately 20' x 20'. This area must be cleared and 1-foot of material will be stripped from the surface and stockpiled nearby for later use in the disposal pit cap. It is estimated that 15 cubic-yards will be stockpiled.

Remove Rock on Trail - A number of large sandstone blocks must be removed from the trail above the fire hall because they block the trail and present a potential hazard to the structure. Two large rocks have fallen onto the jeep tail and must be removed. The larger rock could weigh up to 4.5 tons. The rocks will be hauled to Disposal Area A. The Contractor will be responsible for insuring that all structures and facilities at the base of the slope will be protected from damage resulting from his operations. The approximate size on each rock is as follows:

Rock A	4½' x 3½' x 3½'	2.0 cubic-yards
Rock B	1½' x 5' x 5'	1.4 cubic-yards

Regrade Jeep Trail - Approximately 160-feet of the mine access road which cuts across the slope above the fire hall will be regraded with a road profile that slopes into the hillside at 12H:1V as illustrated on Sheet 3 of the Site Plans. The finished road will be widened to a width of 12-feet. In order to widen the trail, it will be necessary to lower the existing grade. Due to the steep slope conditions in the area and the proximity of the fire hall at the base of the slope, the road will need to be excavated to grade. It is anticipated that all material cut from the slope during this operation will need to be moved to the disposal areas specified on the site plan. It is estimated that 85 cubic-yards of excavation will be required to establish the required road width. An average cut slope of 1H:1V will be maintained unless the Owner's engineering representative authorizes a steeper slope based on field observations. The disposal areas will be located at the northwest end on the jeep trail and below the trail at the southeast end. The Contractor will be responsible for insuring that all structures and facilities at the base of the slope will be protected from damage resulting from his operations.

Neutralize Coal Slack - The coal slack area on the slope between the fire hall and the jeep trail and both disposal pits will be neutralized by incorporating lime into the top 6-inches. Application will be at the rate of 30 tons per acre requiring 8.4 tons of 100% pure Calcium Carbonate. The Contractor will provide the Owner's representative with a certification of purity, size analysis, and weight for the lime delivered on site prior to application. Due to the steep slope conditions and the size of the application area, it is anticipated that bagged lime will be spread and incorporated by hand. There are a few bushes growing on the coal slack area. These bushes will be left in-place; so, the Contractor will be required to work around the bushes. The lime will be applied directly to the existing surface and mixed with the soil to a depth of 6-inches. The coal slack covers an area of 0.25-acres extending from an existing fence on the east side of the fire hall to about the west edge of the fire hall.

The two disposal areas will contain oxidized coal which must be neutralized. After the material excavated from the jeep trail has been graded in the disposal areas, lime will be incorporated into the top 6-inches. It is anticipated that 0.03-acres of coal waste will be neutralized in the disposal pits. The Contractor will make all arrangements for obtaining adequate quantities of lime and for delivering it to the site. A total of 0.28-acres of neutralization is required.

Disposal Pit Cap - After the jeep trail regrading waste has been placed, compacted, grade, and neutralized in the disposal pits, the material stockpiled during the disposal pit excavation will be spread to provide a 1-foot thick layer over the top of the waste material. Any remaining material in the stockpile will be added to the cap and blended into the contours around the cap. The caps on Disposal Areas A and B will be graded to provide positive drainage as shown on the site plans. Disposal Pit A will require 85-cubic yards and Disposal Pit B will require 15 cubic-yards.

Provide and Place Imported Coversoil - Six-inches of cover soil, which must be provided by the Contractor will be spread evenly over the neutralized coal slack area, the disposal area, and the grading fill areas. The coverage area is shown on the site plan. The amount of cover soil is estimated at 270 cubic-yards. This work includes procuring an acceptable coversoil, hauling the coversoil to the site, spreading the coversoil, and preparing a seedbed. This work will be performed in accordance with Technical Specification 310 Coversoil. Acceptable coversoil must meet the criteria outlined in Section 310.02, Paragraph B of the Standard Technical Specifications. The Contractor will be required to submit soil analysis and have the soil source approved by the Engineer. The Contractor will make all arrangements for obtaining the soil and will pay all costs associated with soil procurement including delivery.

The coal slack area which must be covered with topsoil is situated on a steep slope (around 1.5H:1V to 2.5H:1V) below the jeep trail. The fire hall sits at the base of the hill approximately 10-feet from the toe of the slope. It is anticipated that the coversoil will be dumped at the jeep trail and then pushed and racked down the slope. Due to the proximity of the structures, hand-work should be anticipated. The coversoil will be spread evenly and brought to a friable condition so that seeding can proceed without additional soil preparation.

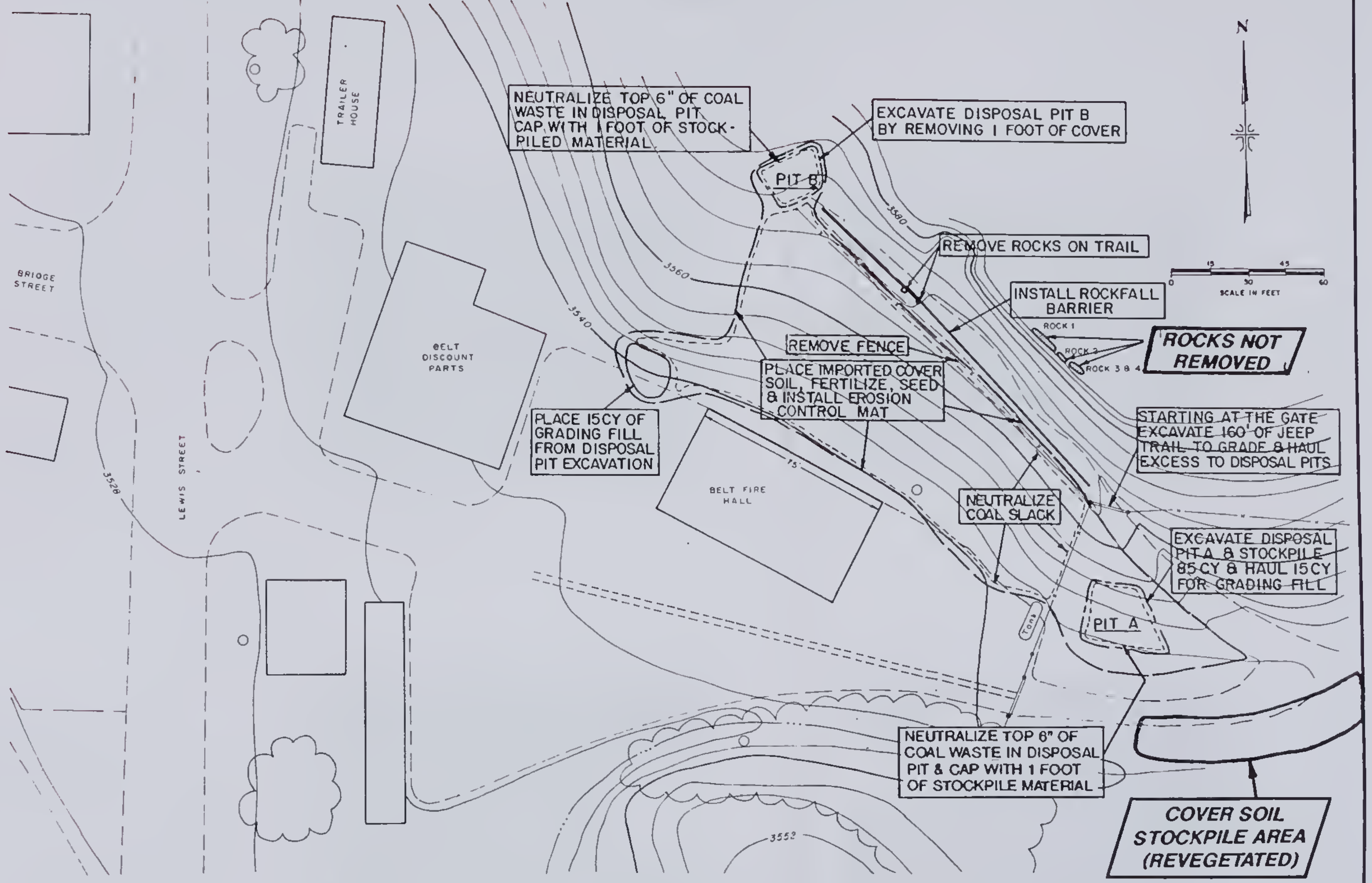
Provide and Install Rockfall Barrier - Structures must be protected from damage by falling rock during construction and in the future. A 150 foot long rockfall protection barrier will be installed on the regraded jeep trail. This barrier will be 8-feet high and will be constructed of 12 ga. highway guardrail attached to metal posts. The metal posts will be WF 8" x 18# I-beams and will be 16-feet in length. All posts will be installed with the bottom 8-feet below grade and will be on 6'3" centers. The top 8-feet will be painted as required in the special technical specifications. Barrier rails between posts will consist of five (5) guardrail sections attached to each post with ⅝-inch in diameter oval shoulder button head bolts and nuts. All rails will be galvanized metal guardrail conforming to the requirements of ASSHD M180, Class A, Type 1. Post holes for I-beam posts will be 12-inches in diameter. All posts will be set in 3000 psi concrete. The alignment of the fence is shown on the site plan A portion of an existing barbed-wire fence will be removed to allow installation of the barrier. The remaining portion of the fence will be joined with the barrier to form a continuous fence line. Rockfall barrier shall meet the requirements of the layout drawings on the site plan. Special technical specifications for the rockfall barrier are included in this bid package. The Contractor will make all arrangements for procuring and fabricating components and for delivering all materials to the site.

Fertilize and Broadcast Seed - The neutralized area and adjacent fill areas (approx. 0.34 acres) will be broadcast seeded and fertilized. Areas that are seeded by the broadcast method will be seeded using an application rate of 48 pounds of pure live seed per acre which is twice the application rate for drill seeding. The Contractor will make all arrangements for obtaining adequate quantities of the specified seed mixture and fertilizer and for delivering them to the site.

Erosion Control Mat - Erosion control mat shall be applied to all reseeded areas as shown on the Site Plans. Erosion control mat shall consist of North American Green SC-150 or equivalent. The mat shall be installed according to manufacturer's recommendations by unrolling the mat down the hillside. All installed mat should be laid loosely and stapled to the ground. The Contractor will be required to lay the mat around existing bushes. Staples shall be placed according to manufacturer's recommendations and shall be 8 gauge steel wire staples at least eight inches long (8" x 2" x 8"). The Contractor will make all arrangements for obtaining the necessary materials and for delivering them to the site. It is estimated that 0.34-acres or 1,646 square-yards will be covered with erosion control mat.

Remove Unstable Rock - After the rock fall barrier is installed, the Owner may order potentially unstable rock removed from the slope above the jeep trail. There are four large sandstone blocks which could pose a potential hazard to the fire hall. These sandstone rocks are currently either wedged or cemented in-place. They are located 20-feet above elevation of the jeep trail and are 15' to 20' from the edge of the trail. The largest of these rocks could weigh up to 13-tons. The Contractor may select the method of removal. The Contractor will be responsible for insuring that all structures and facilities at the base of the slope will be protected from damage resulting from his operations. The work includes removing the specified rocks, disposing of rock, and protecting the nearby structures. The approximate size on each rock is as follows:

Rock #1	5' x 3' x 11'	6.1 cubic-yards
Rock #2	5' x 4' x 2'	1.5 cubic-yards
Rock #3	7' x 3' x 1½'	1.2 cubic-yards
Rock #4	3' x 2' x 1½'	0.3 cubic-yards


N
SCALE IN FEET
0
15
30
45
60
BRIDGE STREET
LEWIS STREET
TRAILER HOUSE
BELT DISCOUNT PARTS
BELT FIRE HALL
3528
3540
3560
3580
3552
75'
PIT B
PIT A
ROCK 1
ROCK 2
ROCK 3 & 4
NEUTRALIZE TOP 6" OF COAL WASTE IN DISPOSAL PIT CAP WITH 1 FOOT OF STOCK-PILED MATERIAL
EXCAVATE DISPOSAL PIT B BY REMOVING 1 FOOT OF COVER
REMOVE ROCKS ON TRAIL
INSTALL ROCKFALL BARRIER
ROCKS NOT REMOVED
REMOVE FENCE
PLACE IMPORTED COVER SOIL, FERTILIZE, SEED & INSTALL EROSION CONTROL MAT
PLACE 15CY OF GRADING FILL FROM DISPOSAL PIT EXCAVATION
STARTING AT THE GATE EXCAVATE 160' OF JEEP TRAIL TO GRADE & HAUL EXCESS TO DISPOSAL PITS
NEUTRALIZE COAL SLACK
EXCAVATE DISPOSAL PIT A & STOCKPILE 85 CY & HAUL 15 CY FOR GRADING FILL
NEUTRALIZE TOP 6" OF COAL WASTE IN DISPOSAL PIT & CAP WITH 1 FOOT OF STOCKPILE MATERIAL
COVER SOIL STOCKPILE AREA (REVEGETATED)

LIST OF ACTUAL WORK QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	ACTUAL QUANTITY	SITE NAME
1.	MOBILIZATION	LUMP SUM	1	BELT FIRE HALL
2.	REMOVE FENCE	FEET	160	JEEP TRAIL
3.	DISPOSAL PIT EXCAVATION	CUBIC YARD	115	JEEP TRAIL
4.	DISPOSAL PIT CAP	CUBIC YARD	100	JEEP TRAIL
5.	PROVIDE AND PLACE IMPORTED COVER SOIL	CUBIC YARD	342	COAL SLACK, FILL & DISPOSAL AREAS
6.	PROVIDE AND INSTALL ROCKFALL BARRIER	FEET	150	JEEP TRAIL
	Metal Guard Rail	FEET	750	
	WF 8" x 18# post	FEET	400	
7.	REGRADE JEEP TRAIL	CUBIC YARDS	125	JEEP TRAIL
8.	NEUTRALIZE COAL SLACK	ACRES	0.25	COAL SLACK
		ACRES	0.03	DISPOSAL AREAS
	100% Calcium Carbonate	TONS	9.60	@34 tons per ac per 6" slice
9.	EROSION CONTROL MAT (0.34 Acres)	SQ YARDS	1,800	COAL SLACK, FILL & DISPOSAL AREAS
10.	FERTILIZE AND BROADCAST SEED	ACRE	0.40	COAL SLACK, FILL & DISPOSAL AREA
	Fertilize	LBS	113.6	
	Seed	LBS-PLS	24.03	
11.	REMOVE ROCK ON TRAIL	CUBIC YARDS	3.4	JEEP TRAIL
12.	REMOVE UNSTABLE ROCK	CUBIC YARDS	0	SLOPE

LOOKING NORTHEAST AT THE UNSTABLE SLOPE ABOVE THE FIRE HALL.

AS–BUILT DRAWING

SITE PLAN AND WORK DESCRIPTION

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

STATE OF MONTANA, DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
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1413 4th Avenue North
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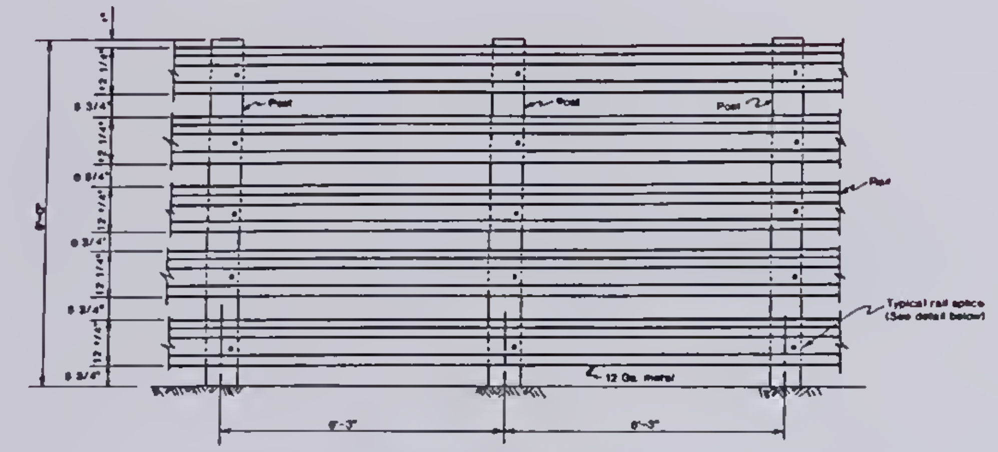
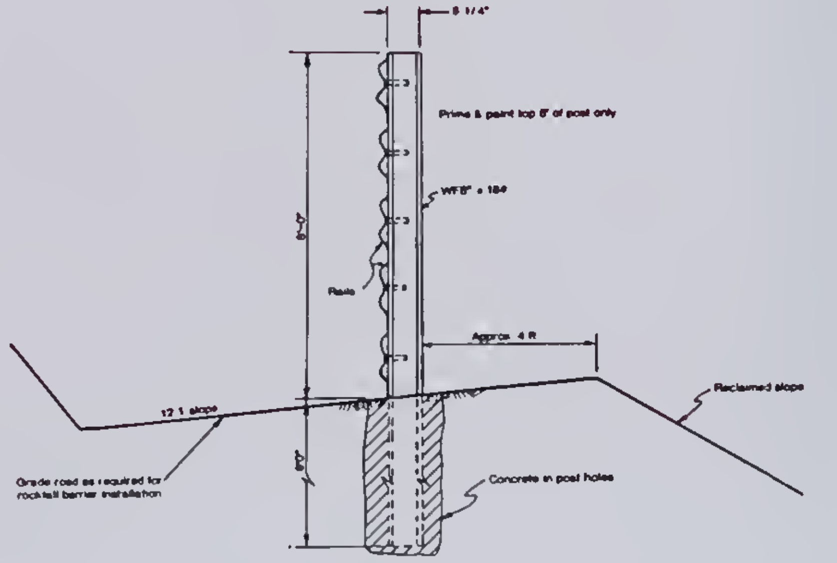
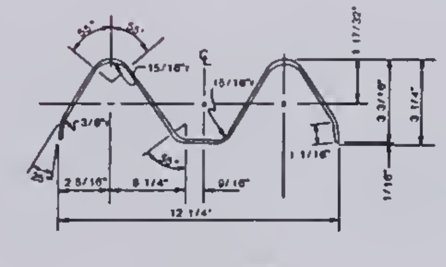
SHEET NO. 2 of 3



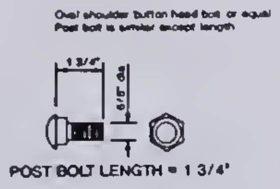
METAL GUARD RAIL
(Not To Scale)


8 1/4"
Prime & paint top 6' of post only
WF8" x 18#
Rails
Approx. 4 ft
12:1 slope
Reclaimed slope
Grade road as required for rockfall barrier installation
Concrete in post holes

METAL GUARD RAIL CROSS SECTION A–A'
(Not To Scale)



RAIL SECTION


Oval shoulder button head bolt or equal
Post bolt is similar except length
1 3/4"
5/8" dia.

POST BOLT LENGTH = 1 3/4"

SPLICE BOLT & NUT

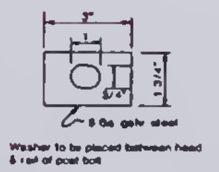
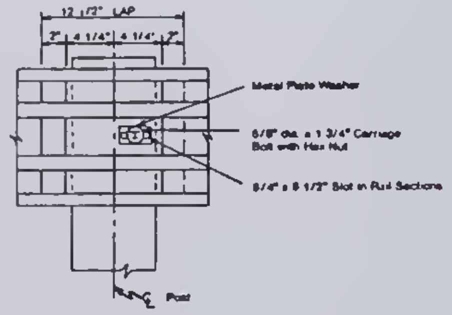


PLATE WASHER DETAIL


12 1/2" LAP
2"
4 1/4"
4 1/4"
2"
Metal Plate Washer
5/8" dia. x 1 3/4" Carriage Bolt with Hex Nut
3/4" x 6 1/2" Slot in Rail Sections
Post

RAIL SPLICE DETAIL

NOTES

RAIL: GALVANIZED RAIL SHOULD BE GALVANIZED IN ACCORDANCE WITH ASTM A 525 OR ASTM A 123. STEEL RAIL SHALL CONFORM TO ASSHO M 180.

③ VIEW OF SLOPE ON EAST SIDE OF THE FIRE HALL. DISPOSAL PIT A WILL BE EXCAVATED ON THE EAST SIDE OF THE FENCE.

④ FIFTEEN CUBIC YARDS OF GRADING FILL WILL BE USED TO RECONTOUR THIS STEEP CUT SLOPE.

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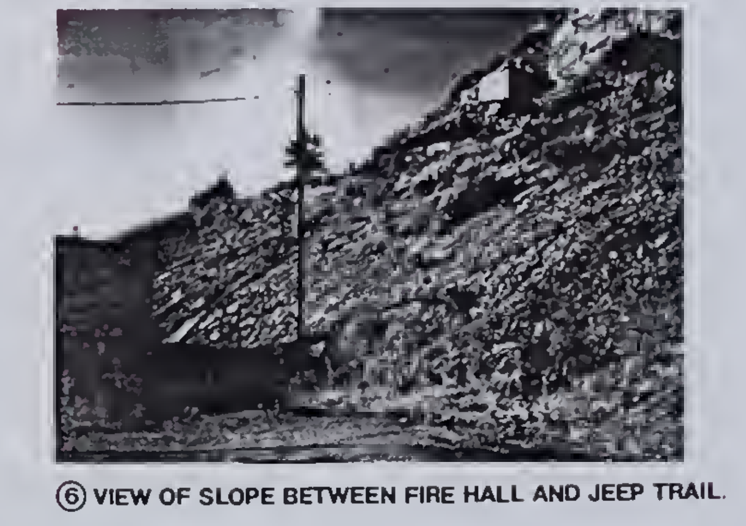

⑥ VIEW OF SLOPE BETWEEN FIRE HALL AND JEEP TRAIL.

① VIEW OF JEEP TRAIL & EXISTING FENCE.

② VIEW OF ROCKS BLOCKING JEEP TRAIL.

⑦ VIEW OF UNSTABLE ROCKS ON CLIFF.

AS–BUILT DRAWING

SITE PLAN AND ROCKFALL BARRIER DETAIL

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

STATE OF MONTANA, DEPARTMENT OF STATE LANDS
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REVISIONS		
NO.	DATE	BY

SHEET NO. 3 of 3

ATTACHMENT 7

PHOTOGRAPHS/SLIDES

PHOTO LISTING

PHOTOS/SLIDES

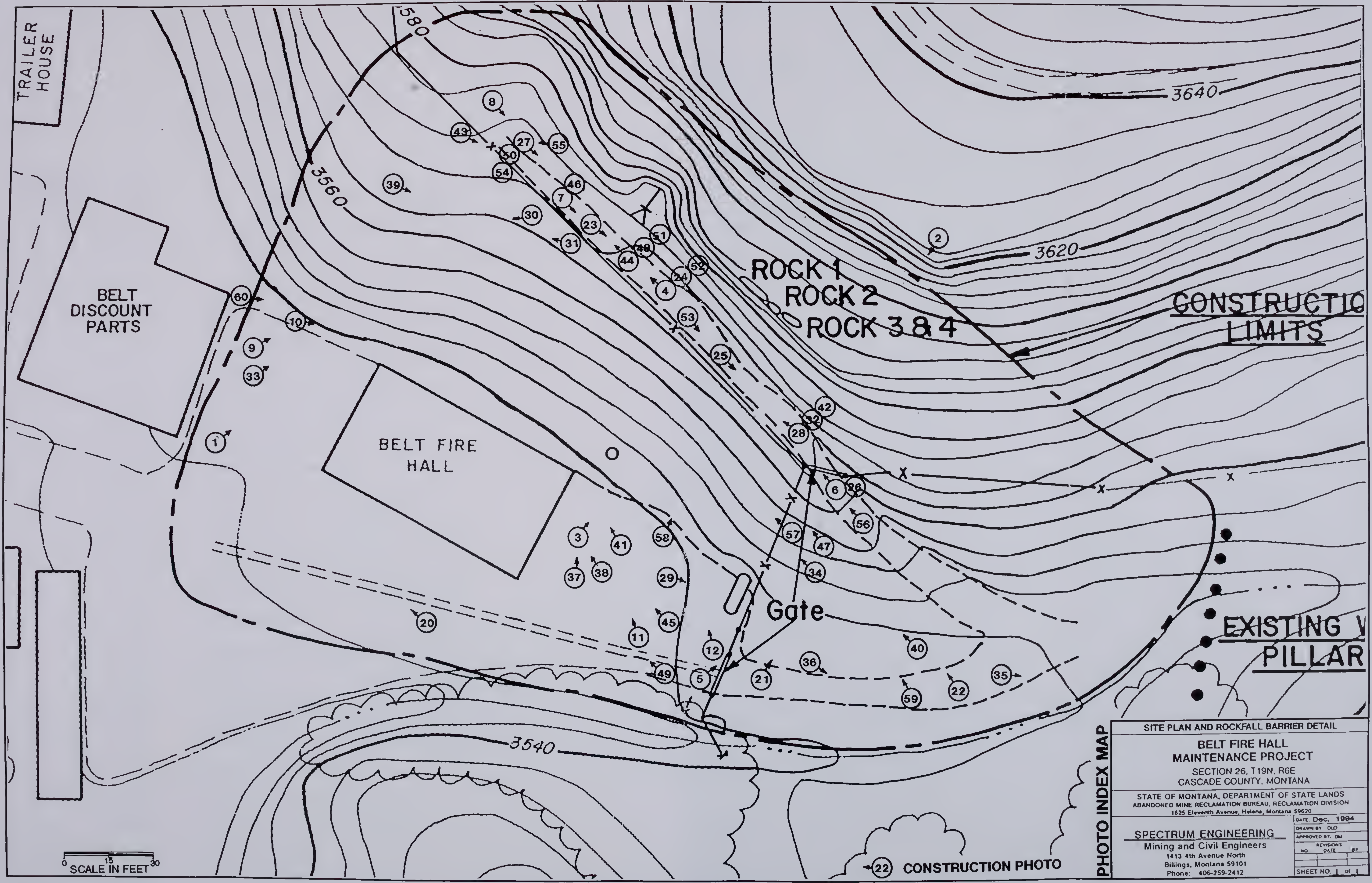

PHOTO INDEX MAP

SITE PLAN AND ROCKFALL BARRIER DETAIL

BELT FIRE HALL
MAINTENANCE PROJECT
SECTION 26, T19N, R6E
CASCADE COUNTY, MONTANA

STATE OF MONTANA, DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
1625 Eleventh Avenue, Helena, Montana 59620

SPECTRUM ENGINEERING
Mining and Civil Engineers
1413 4th Avenue North
Billings, Montana 59101
Phone: 406-259-2412

DATE. Dec. 1994
DRAWN BY DLO
APPROVED BY. DM

REVISIONS		
NO	DATE	BY

SHEET NO. 1 of 1

PHOTO LISTING

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
1	10-21-93	Pre-construction view of fire hall, slope, and cliff
2	10-21-93	Pre-construction looking down from top of cliff to fire hall
3	10-05-94	Pre-construction sandstone cliff above fire hall
4	10-05-94	Pre-construction fallen rock on jeep trail behind fire hall
5	10-30-94	Pre-construction disposal pit area at southeast end of jeep trail
6	10-30-94	Pre-construction jeep trail near gate
7	10-05-94	Pre-construction jeep trail and existing fence
8	10-30-94	Pre-construction northwest end of jeep trail
9	10-30-94	Pre-construction steep slope area near west end of fire hall
10	10-05-94	Pre-construction slope behind fire hall looking east
11	10-05-94	Pre-construction slope behind fire hall looking west
12	10-05-94	Pre-construction slope at east end of fire hall
13	11-0-94	Contractor's equipment - Cat 120 motor grader
14	11-01-94	Contractor's equipment - Cat 950 wheel loader
15	11-01-94	Contractor's equipment - John Deere 450-B bulldozer
16	11-02-94	Contractor's equipment - John Deere 410B backhoe/loader
17	11-03-94	Contractor's equipment - Ford 7000 dump trucks (6 CY)
18	11-10-94	Contractor's equipment - hand (horse drawn) scraper
19	11-14-94	Sub-contractor's rotary drill
20	11-03-94	Material delivery from Roscoe Steel
21	11-02-94	Coal waste from jeep trail in disposal pit
22	11-15-94	Disposal pit reclaimed
23	11-02-94	Removing fallen rock from jeep trail

BELT FIRE HALL MAINTENANCE PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
24	11-02-94	Bulldozer working on northwest end of jeep trail
25	11-02-94	Wheel loader removing coal waste on jeep trail
26	11-02-94	Bulldozer piling up coal waste on jeep trail
27	11-03-94	Regraded jeep trail looking southeast
28	11-03-94	Regraded jeep trail looking northwest
29	11-07-94	Bagged lime stored on trailer
30	11-07-94	Spreading bagged lime
31	11-07-94	Incorporating lime
32	11-07-94	View of lime on slope along regraded jeep trail
33	11-08-94	Neutralized slope looking from west end of fire hall
34	11-08-94	Neutralized slope looking from east end of fire hall
35	11-03-94	Delivering cover soil to stockpile
36	11-29-94	Reclaimed cover soil stockpile area
37	11-09-94	Using wheel loader to dump cover soil onto slope below jeep trail
38	11-09-94	Bulldozer work to spread cover soil on slope below jeep trail
39	11-09-94	Raking cover soil down slope below jeep trail
40	11-10-94	Cover soil spread over disposal pit area
41	11-04-94	Rockfall barrier components stacked on pallets
42	11-10-94	Starting to layout rockfall barrier fence
43	11-14-94	Hauling posts up to jeep trail
44	11-15-94	Using rotary rig to drill 8-foot deep post holes
45	11-15-94	Rotary drill rig on jeep trail
46	11-16-94	Post holes for rockfall barrier
47	11-16-94	Delivering concrete to set I-beam posts
48	11-16-94	Using rail to align post for rockfall barrier and pouring concrete

BELT FIRE HALL MAINTENANCE PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
49	11-17-94	Hauling guardrail up to jeep trail after snow storm
50	11-21-94	Installing guardrail on I-beam posts
51	11-21-94	Installing fourth row of guardrail on I-beam posts
52	11-22-94	Installing fifth row of guardrail on I-beam posts
53	11-21-94	Installing fifth row of guardrail on I-beam posts
54	11-23-94	Finished rockfall barrier looking toward gate
55	11-28-94	Joining rockfall barrier to fence line
56	11-28-94	Joining rockfall barrier to gate
57	11-22-94	Erosion control mat on slope at east end of fire hall
58	11-23-94	Installing erosion control mat on slope behind fire hall
59	11-29-94	Looking northwest at the finished site
60	11-29-94	Looking east at the finished site

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CAT
CATERPILLAR
94 11 1

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JOHN DEERE
94 11 1

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JOHN DEERE
94 11 2

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